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FROM

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MARKET CROPS OF FLORIDA

COMPLIMENTS OF

BRADLEY FERTILIZER WORKS

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY

JACKSONVILLE, FLORIDA

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TABLE OF CONTENTS

PAGE

INTRODUCTION v

Bradley's fertilizers are the outgrowth of practical experience . vi

PART ONE 1

The early history of fertilization 1
Facts about plant foods which every grower should know . . 3
Important ingredients of fertilizers 7
Lime: an inexpensive, but important soil builder
Wood ashes valuable. 10
Barnyard manures 12
The importance of crop-producing quality in fertilizers . . . 13
Heavy but judicious fertilization pays 16
New and approved methods of applying fertilizers 17
Important types of Florida soils 18
The irrigation of truck crops 20
Crop rotation and animal husbandry in connection with trucking 23

PART TWO 25

Introductory Note 25

Section One: Truck Crops 25

Beans 25
Navy Beans 27
Beets 27
Cabbage and Cauliflower 28
Cantaloupes and Watermelons 30
Carrots 31
Celery 32
Cucumbers 34
Eggplant 36
Lettuce 38
Onions 39
Peas 40
Peppers 41
Potatoes 42
Summer or Bush Squashes 47
Strawberries 48
Tomatoes 50

Section Two: Summer Crops and Staples 52

Cassava 52
Castor Beans 53
Corn 55
Cotton 61
Cowpeas 63

PAGE

Grass and Forage Crops . . . 64
Alfalfa . . . 65
Japanese Clover . . . 66
Vetch . . . 66
German Millet . . . 67
Guinea Grass . . . 67
Natal Grass . . . 68
Para Grass . . . 68
Rhodes Grass . . . 68
Sudan Grass . . . 68
Oats . . . 68
Peanuts . . . 72
Pineapples . . . 74
Rice . . . 76
Rye . . . 77
Sorghum . . . 79
Sugar Cane . . . 80
Sweet Potatoes . . . 81

Section Three: Crops for the Home Garden . . . 84

Asparagus . . . 84
Lima Beans . . . 85
Red Kidney Beans . . . 86
Okra . . . 86
Pumpkins . . . 86
Radishes . . . 87
Sweet Corn . . . 87
Turnips . . . 88

PART THREE. . . . 90

Inoculating Legumes . . . 90

Fungicide Formulas: . . . 91
Ammoniacal Copper Carbonate . . . 91
Bordeaux Mixture . . . 91
Corrosive Sublimate . . . 92
Formalin . . . 92
Pyrox . . . 92

Insecticide Formulas: . . . 93
Arsenate of Lead . . . 93
Carbolic Acid Emulsion . . . 93
Kerosene Emulsion . . . 93
Paris Green . . . 93
Tobacco Decoction . . . 93
Whale Oil Soap . . . 94

Number of plants to the acre at given distances . . . 94
Legal weights for Florida . . . 95
Seeding and planting data . . . 96

INTRODUCTION

The grower is a specialist whose business is profitable in proportion as he studies soils, cultivation, fertilization and the other factors that enter into the production of crops. Guesswork has no place in the practice of the progressive grower. He appreciates the importance of knowing the best methods of cultivating his soil and what crops he can grow most profitably, and is ever on the lookout for useful information. He is well informed, because he profits by his own experience and that of others.

This book has been prepared as an aid to growers who realize that "knowledge is power." It covers, in a thorough way, the market crops of Florida. The information which it contains has been gathered and prepared in condensed form for Florida growers in the hope that even the most experienced will find herein valuable hints and suggestions.

Part one of the book, commencing on page 1, tells what good fertilizers are, of what they are made, what to expect and what not to expect from their use. It also contains information about soils, plant foods, cultivation, irrigation and other matters pertaining to the production of crops.

Part two, commencing on page 25, is devoted to a discussion of important Florida crops. Helpful suggestions are given regarding planting, fertilizing, spraying and marketing. It will pay you to read about the crops you are now producing and about others which you can perhaps produce with profit. Especial attention has been paid to summer crops and to staple soil-building crops that can be produced at times when the land would otherwise be idle. You are in business to make money and are anxious to learn anything that will enable you to increase your profits. Even one good suggestion may mean dollars to you; with this in mind, read the book through.

Part three, commencing on page 90, contains useful tables and directions for making insecticides and fungicides.

Our new citrus book should also be in the hands of every grower of citrus fruits. It covers the subject of citrus culture in an interesting and practical way. We also publish a complete set of small booklets devoted to special crops. These tell about methods employed in the trucking sections of the North. Although Northern methods are not always adaptable to Florida conditions, we are sure you will find the books intensely interesting and valuable. We shall be glad to furnish, without cost, booklets relating to those crops in which you are interested.

THE BRADLEY FERTILIZER WORKS
JACKSONVILLE, FLORIDA

BRADLEY'S FERTILIZERS ARE THE OUTGROWTH OF PRACTICAL EXPERIENCE

In the past there were ardent advocates of "purely organic" fertilizers, made from animal or vegetable materials, such as cotton-seed meal, fish scrap, tankage and blood; and there were others who believed in "strictly chemical" fertilizers, made from such materials as nitrate of soda, sulphate of potash and acid phosphate. Bradley's Fertilizers have never been classed as strictly "organic" or "chemical," for they have always been high grade "commercial fertilizers" which combine the best features of "organic" and "chemical" fertilizers. Mr. William L. Bradley, founder of the Bradley Fertilizer Works, was one of the earliest to manufacture and sell high-grade complete commercial fertilizers, containing ammonia, phosphoric acid and potash.

Among his business associates Mr. Bradley was esteemed particularly for his integrity and sound judgment. He was always practically interested in farming and was noted for his devotion to business and to his family. He often remarked, "The best fertilizers can be made only by the proper combination of suitable, available organic and inorganic materials." He showed conclusively that farmers could not afford to jeopardize their crops by depending solely upon raw fertilizer materials or upon only one or two available ingredients of plant food, any more than they could expect their cattle to thrive on straw and salt.

Mr. Bradley's thoroughness was shown, not only by the way he applied scientific principles to the compounding and manufacturing of fertilizers, but also by the thorough theoretical and practical training he gave his sons who have succeeded him so successfully in charge of the business. The elder son, now holding the highest office in the company, was given a thorough business training and a term of apprenticeship in the factory before working his way up in the office of the Bradley Fertilizer Works.

Bradley's Fertilizers are prepared from carefully selected materials, which are subjected to the most approved chemical treatment in order to render them properly available. They are then mixed, cured, and seasoned by the best-known factory methods in order that they may be in the best mechanical condition and that every particle of fertilizer may carry to the plant the several food elements upon which its daily growth and ultimate yield are dependent. It is because they are compounded scientifically and thoroughly that Bradley's Fertilizers have become known throughout the United States. They are the fertilizers which have stood the test of crops in the field for more than half a century.

PART ONE

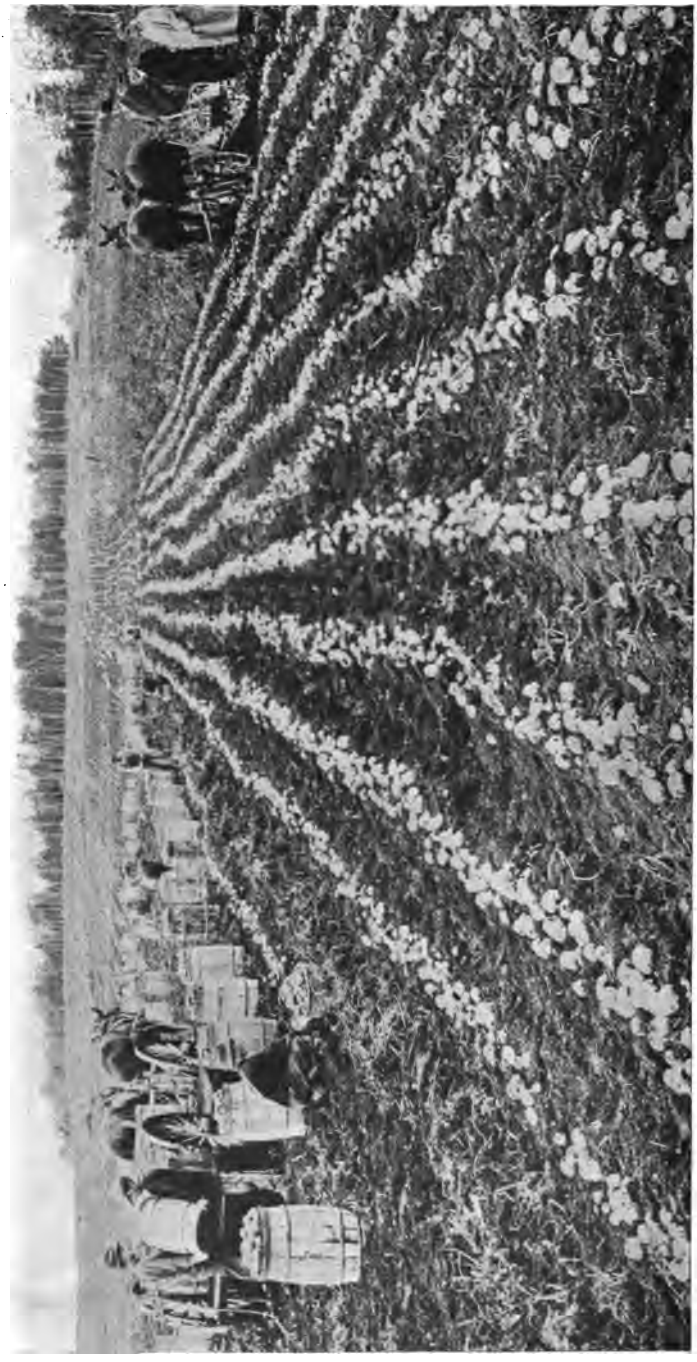
THE EARLY HISTORY OF FERTILIZATION

What is a fertilizer A true or direct fertilizer is a substance which, when applied to the soil, increases growth by supplying necessary plant food.

First use of fertilizers Commercial fertilizers were first used in Europe, although certain of their ingredients were used by the early Romans and doubtless even earlier by the Chinese. In the early days straw, which was considered of little or no value, was burned. It was discovered, however, that where straw ash was spread upon the ground the crops were greatly improved in size and quality.

The early use of dung Since the dawn of animal husbandry it must have been known that the dung dropped by farm animals increases the growth of plants. This observation led to the saving and use of dung, but up to less than a century ago it was not known *how* dung increased the productiveness of the soil. One of the early ideas advanced was that the "spirits" left decaying manure and by entering the plant produced more vigorous growth.

The dawn of scientific fertilization The first systematic work showing that plants use as food the mineral elements from the soil was published by DeSaussure in 1804. In 1840 Liebig's famous report to the British Association entitled "Organic Chemistry in its Applications to Agriculture and Physiology" was published. This report was based on many experiments and was so forcefully written that it provoked vigorous discussion and careful study of agricultural problems. Liebig's work may be said to have laid the foundation for the intelligent use of fertilizers and scientific farming. Later the experiments with fertilizers conducted by Sir J. B. Lawes and Dr. Gilbert at Rothamsted, England, did much for the advancement of agriculture.



A field of Irish Cobbler seed potatoes at Presque Isle, Maine, grown with 2,500 pounds to the acre of our fertilizer. This crop yielded 660 bushels to the acre.

The use of fish by the American Indians

For many centuries prior to the discovery of America, the Indians had cultivated the natural clearings and raised their native corn (maize). Repeated cropping reduced the natural fertility of these clearings until they failed to produce the customary yields. The poor crops of corn doubtless led the Indians to experiment with fish, which were plentiful. It was found that by planting a fish in a hole beneath the corn better crops were obtained. We now know that as the fish decayed it supplied the plant with available nitrogen and phosphoric acid. Finally the use of fish, which contain no potash, failed to produce satisfactory results and the crops again became poor.

Fish and ashes made a complete fertilizer

The Indians observed that where there had been a fire the growth of weeds and grass was stronger than before; thus they learned to use both ashes and fish, and yields became heavier again. This was doubtless the first use in America of a complete fertilizer containing the three important plant foods: nitrogen, phosphoric acid and potash.

FACTS ABOUT PLANT FOODS WHICH EVERY GROWER SHOULD KNOW

Of the ten or more elements essential to plant growth, only a few need to be supplied by the grower. The others are furnished in abundance by Nature.

What plant foods are needed

Nitrogen, phosphoric acid and potash are essential plant foods which must be supplied by the farmer. In some instances lime, magnesia and other substances are also needed to ensure the most profitable production of farm crops.

Why deficient plant foods must be supplied

An excess of one plant food in the soil will not make up for the total lack or serious deficiency of another. All essential plant foods must be present or crops will not grow. The element which is most deficient in the soil is the one which limits the growth of the crop, just as the weakest link in a chain measures its strength. If, for example, your soil is supplied with enough phosphoric acid for a 300-bushel crop of potatoes and only enough nitrogen or potash for a 100-bushel crop, you will get a yield of only 100 bushels. This shows the importance of using complete fertilizers — those which supply to the plant in available form all of the needed foods which are likely to be deficient in the soil.

Nitrogen or ammonia

The nitrogen in fertilizers is commonly referred to in terms of ammonia. Seventeen pounds of ammonia contain fourteen pounds of nitrogen.

Effects of nitrogen on crops

On soils deficient in nitrogen plants grow slowly, the leaves have a pale green or yellowish appearance, and both leaves and stalk become stunted. If there is an excess of nitrogen, certain crops such as the small grains grow rapidly, become rank, and are likely to lodge. An abundant growth of stalk and leaf, of a healthy green color, is nevertheless, necessary to a good crop, and it indicates usually that the soil contains an adequate supply of nitrogen.

Sources of nitrogen and its availability

The principal sources of nitrogen in fertilizers are: fish scrap, blood, tankage, cottonseed meal, nitrate of soda and sulphate of ammonia. These materials stand in about the following order in respect to the rapidity with which their nitrogen becomes available:

1. Nitrate of soda.
2. Sulphate of ammonia.
3. Dried blood, bone tankage, fish scrap, cottonseed meal, castor pomace, high-grade blood and bone, and fine bone meal.

Phosphoric acid and phosphorus

Phosphoric acid (containing phosphorus) is the fertilizing ingredient especially needed for the formation of the grain or seed. It is found also in the stalks and leaves of all plants. Bone, which constitutes the skeleton or framework of man and the higher animals, is a combination of phosphoric acid and lime ("bone phosphate"). Since the higher animals subsist largely on grains and seeds, it was a wise provision of Nature that these foods should contain large amounts of phosphoric acid.

Sources of phosphoric acid

Bone, which contains from 22 to 27 per cent. of phosphoric acid, was the original commercial source of this important plant food. Early in the last century Liebig found that the treatment of bone with sulphuric acid, which transformed it into "dissolved" bone or what is now known as superphosphate, made it far more available to plants. The demand for this fertilizer soon increased to such an extent that the supply of bone became insufficient, and finally rock phosphate practically replaced bone for the manufacture of superphosphate (acid phosphate). Thus the immense deposits of rock phosphates in different parts of the world have assumed immense importance.

Effect of phosphoric acid on crops

If your grain crops have a good growth of stalk and leaf, and the kernels are shriveled, small or light, the supply of phosphoric acid may be deficient. You can well afford to be generous in supplying it, for any surplus not used the first season remains in the soil for future crops.

Potash and its effect upon crops

Potassium, usually referred to in its combination with oxygen as potassium oxide or potash, is the element chiefly concerned in building the fibre of the plant. It stiffens the straw and stalk and aids in the formation of starch and sugar. A surplus of potash in the soil, as in the case of phosphoric acid, is neither lost nor does it have a noticeable effect on the crop. If, however, there is an insufficient supply of potash, it is shown by a soft, unsatisfactory growth of the plants and delayed maturity.

Plants have different food requirements

Different kinds of plants require different proportions and amounts of the various plant foods. Tobacco and potatoes, for instance, feed heavily on potash, and the grasses and corn on nitrogen; whereas clover and turnips require large amounts of phosphoric acid.

Fertilizers maintain fertility

The growing of consecutive crops without fertilization exhausts the soil, but if fertilizers are used to replace the plant foods which are removed in the crops, soil depletion stops.

Fertilizers are not stimulants but actual plant food

"Are fertilizers stimulants?" Nitrogen, phosphoric acid and potash are to plants exactly what meat, potatoes and bread are to man. In order to grow well man must have good and abundant food — so must plants. It is just as important that nitrogen, phosphoric acid or potash in an available form should be at the disposal of the plant as it is that wholesome and digestible food should be given to a child. Good available fertilizer is therefore no more a stimulant for plants than good digestible food is a stimulant for man.

If fertilizing pays, keep at it

Fertilizers will help you to produce big and profitable crops as long as you use them. But if you stop fertilizing your crops, profits will drop finally to where they were before you began. Fertilizers are needed to feed your crops just as grain and roughage are needed for your cattle. You would not stop feeding a steer you were fattening for market — nor should you expect to grow big crops if you stop feeding them.

A crop of velvet beans and corn grown on our fertilizer. The invitation to the cows to partake of it was accepted joyfully and without delay.

This is well illustrated by the experience of a farmer who was producing 35 bushels of corn to the acre without fertilizer. A fertilizer salesman, after much argument, prevailed on him to use 300 pounds of good fertilizer to the acre. That year the yield was 80 bushels to the acre. The third year the field was again planted to corn, but no fertilizer was used. The yield was only 37 bushels to the acre and the farmer complained that his land had been spoiled by the fertilizer which he had used the year before. It did not occur to him that the land was even slightly richer the third year than it was before he raised the bumper crop with fertilizer. He had been thinking solely of his 80-bushel crop instead of his original yield of 35 bushels. It was an 80-bushel field when fertilized, but a 35-bushel field when not.

Big crops economize labor

Plowing, harrowing, planting and seeding cost just as much whether you raise 35 bushels to the acre or 80. Practically the only added cost is for fertilizer, but is there any other investment which will bring equal returns?

Many rich lands respond to fertilizers

Many soils which produce well without fertilizer yield larger crops and greater profits with it. Everglade mucks, for example, which produce naturally from 30 to 50 bushels of corn per acre will often yield a big increase and larger profit if a small amount of suitable fertilizer is used. No man should be satisfied with moderate crops and profits if by the use of fertilizer he can secure larger ones. Fertilizer often produces greater increases in crops when used on a fertile soil in good tilth than when used on a depleted soil in poor tilth.

More fertilizer, bigger crops

The high price of labor, foods, feeding stuffs, farm equipment and supplies compels greater economy in tillage *or the production of larger crops.* More fertilizer will give the larger crops which are necessary to cover the increased cost of production.

IMPORTANT INGREDIENTS OF FERTILIZER

Organic and inorganic plant foods

Plant foods are derived: (1) from organic materials (plants and animals), such as tankage, bone, blood, fish scrap, cottonseed meal, castor pomace and cyanamid; (2) from inorganic materials, such as nitrate of soda, calcium nitrate, acid phosphate, nitrate of potash, muriate of potash, sulphate of potash and sulphate of ammonia.

Summer squashes with celery in the background, Bradentown, Florida. The celery which preceded the squashes received two tons to the acre of our fertilizer. The squashes were grown with the fertilizer left in the ground by the celery.

Nitrate of soda

Nitrate of soda, due to its immediate availability and high nitrogen content, is one of the most valuable fertilizing materials known. It is particularly adapted to such crops as cabbage, celery and lettuce, since it produces the desired crispness by promoting rapid growth. It is, however, too soluble for chief or exclusive use as a source of nitrogen on open soils for the slowly growing crops such as cereals, corn and cotton.

It must be used with care

In order to obtain the best results from nitrate of soda, special care must be exercised in its use. In case of heavy rains it leaches rapidly from sandy soils. It should not be applied to plants when they are wet, as the crystals are likely to stick to the foliage and burn it. An excessive application will promote too rank a growth. Since nitrate of soda can be utilized by plants without undergoing changes in the soil and since it dissolves rapidly, its action is almost immediate.

The residue of soda remaining in the soil where nitrate of soda has been used aids somewhat in keeping the soil sweet.

Sulphate of ammonia

Sulphate of ammonia is a by-product of the manufacture of coke and gas. It is now used extensively in fer-

tilizers and is considered an excellent source of ammonia. If used continuously it tends to make soils less alkaline or more acid on account of the residual sulphuric acid.

Calcium cyanamid Calcium cyanamid is obtained by passing nitrogen gas over heated calcium carbide, and the small excess of burned lime is slaked with a little steam or water. If used in considerable quantities just before planting or as a top-dressing, it may cause some injury to plants. It usually contains from 19 to 23 per cent. of ammonia.

Dried blood Dried blood, containing 15 to 16 per cent. of ammonia, is especially valuable because it has a high availability and yet is not subject to material loss by leaching. The nitrogen in dried blood is not all immediately available as in nitrate of soda, but it becomes available as the blood decomposes.

Tankage A valuable organic ingredient of fertilizers in general use is the so-called "tankage" or "blood and bone." It consists of pieces of bone, meat scraps and other animal wastes. High-grade tankage contains much meat and relatively little bone, and therefore has a high percentage of ammonia. Low-grade tankage is composed chiefly of bone, and hence contains far less ammonia and much more phosphoric acid.

Fish scrap Fish scrap is obtained by drying and grinding fish offal and inedible fish after the removal of the oil. It is an excellent fertilizer and contains a high percentage of ammonia and phosphoric acid.

Castor pomace Castor pomace is an organic ammoniate obtained as a by-product in the manufacture of castor oil from castor beans. It contains about 6 per cent. of ammonia and some phosphoric acid and potash. It is poisonous to farm animals.

Cottonseed meal Bright cottonseed meal contains about 7½ per cent. of ammonia in addition to some potash and phosphoric acid, and it is suitable for most crops. The heavy demand for cottonseed meal as feed is steadily increasing its cost. In Florida it is not very popular excepting with growers of pineapples and Irish potatoes, but elsewhere it is used extensively for tobacco.

Dark cottonseed meal, the ground seed of long staple cotton, is of a lower grade than the bright meal. It contains about 5 per cent. of ammonia.

Raw and steamed bone meal Bone meal is produced from skulls, knuckles and similar bones, by grinding them either in their raw state or after steaming. Bone meal is more useful for fruits than for the quick-growing truck crops, since its ammonia is more slowly available than that in tankage or dried blood, and its phosphoric acid is much less available than that in acid phosphate.

Bone black The percentage of phosphoric acid in bone black is much greater than in bone, but it is far less available. After proper treatment with sulphuric acid, bone black becomes what is known as "dissolved bone black," one of the most valuable sources of phosphoric acid for the fertilization of citrus and other fruits.

Acid phosphate Acid phosphate is prepared by treating rock phosphate with sulphuric acid. The phosphate rock contains 30 to 35 per cent. of insoluble phosphoric acid, whereas the resulting acid phosphate contains 12 to 18 per cent. of available phosphoric acid.

Double or concentrated superphosphate Double or concentrated superphosphate contains 31 per cent. or more of available phosphoric acid. It is manufactured from acid phosphate by filtration and precipitation processes. Unlike acid phosphate, it contains little, if any, gypsum.

Precipitated bone Precipitated bone is generally produced by treating bone with hydrochloric acid and neutralizing the resulting solution with lime. In this process the phosphoric acid is transformed into a solid precipitated form that is suitable for all kinds of crops.

Ammoniated phosphate Since the usual ammoniated phosphates carry ammonia from several different sources, they are preferable to the mere mixtures of superphosphate with nitrate of soda or sulphate of ammonia, which are often exported.

LIME: AN INEXPENSIVE, BUT IMPORTANT, SOIL BUILDER. WOOD ASHES VALUABLE.

Lime sweetens the soil Lime is usually more valuable for sweetening sour or acid soils than as a direct source of plant food, although it may help in both ways. Poor drainage, wrong methods of manuring and cultivation and a deficiency of lime contribute to soil acidity. When there is an insufficient supply of lime in the soil, the turning under of cover crops may cause or increase acidity. This is said to be less serious if the crops are previously dried. Lime is the cheap-

A late potato crop at East Palatka, Florida, photographed sixty days after planting. This crop was grown on our fertilizer applied before planting at the rate of 2,000 pounds to the acre.

est and most efficient material for counteracting soil acidity. By maintaining the proper reaction of the soil, it promotes materially the formation of ammonia and nitrates.

Lime improves the physical condition of soils

Lime tends to make heavy soils more friable and sandy soils less open. If the soil is naturally cold and wet in the spring, liming often changes its physical character to such an extent that it can be worked several days earlier.

When to apply lime

Lime may be applied to the soil at all seasons, but in Florida preferably in the late winter or early spring. It should be spread and harrowed into the soil after plowing or after the first harrowing. On very sandy soils, at least three weeks to a month should intervene between a heavy application of lime and a heavy application of fertilizer containing much sulphate of ammonia.

Slaked lime, ground limestone and wood ashes should not be applied just prior to the planting of Irish potatoes, otherwise scab may result. Large applications of slaked or burned lime may decidedly lessen the yield of watermelons which, unlike cantaloupes and muskmelons, thrive well on quite acid soils.

The kind of lime to use Hydrated lime or calcium hydrate, more commonly known as "slaked lime," if used in reasonable quantities is a satisfactory form of lime for most heavy clay soils, and for certain other very acid soils, as it acts quickly. The cheapest form of lime in most localities and the safest for general use is finely ground limestone.

Oyster shells and oyster-shell lime Oyster shells, which are locally cheap and abundant, consist almost entirely of carbonate of lime. If finely ground they are essentially as active as ground limestone. Sometimes they are burned and ground, or burned and slaked, before they are applied to the soil.

The use of wood and plant ashes Wood and plant ashes usually contain 3 to 8 per cent. of potash, 30 to 35 per cent. of lime, some magnesia and a little phosphoric acid. Their value has long been known. On very sandy soils at least two to three weeks should elapse between a large application of ashes and a heavy application of fertilizer containing large amounts of sulphate of ammonia.

Both ashes and lime hasten the nitrification of sulphate of ammonia and of organic ammoniates. Small applications of lime at three- to four-year intervals are preferable to heavy applications at intervals of eight to ten years, for large applications may promote too rapid nitrification and result in loss of nitrates by leaching.

BARNYARD MANURES

Barnyard manure and fertilizer No one questions the efficiency of good barnyard manure that still contains the liquid portion, in which most of the valuable constituents are dissolved. Unfortunately, however, manure can seldom be had in Florida and because of its cost and the small supply, it cannot always be bought and used with profit. It is much more profitable to use it in moderate amounts with acid phosphate or low-grade ammoniated phosphate than to employ enough to supply the needed amount of phosphoric acid. The table below gives the amount of plant food in one ton of barnyard manure, compared with the amount contained in one ton of good commercial fertilizer.

	Barnyard Manure	Commercial Fertilizer
Nitrogen	8 pounds	80 pounds
Phosphoric acid	4 "	160 "
Potash	10 "	60 "
Total	22 pounds	300 pounds

Fertilizer cheaper than manure

This table shows that good complete fertilizer contains ten times as much ammonia, forty times as much phosphoric acid and at least six times as much potash as the average manure. Manure, however, is especially valuable for improving the physical condition of soils. In deciding how much manure it is profitable to use, one should consider the cost of hauling and spreading the manure and the slow action of the ammonia and other plant-food ingredients in the solid portion.

Manure acts slowly

Several years must elapse before the plants can get all the plant foods in manure, whereas high-grade fertilizers of proved crop-producing quality act on the crop at once and carry it to maturity. If used in reasonable amounts fertilizers will also permanently increase the fertility of the soil. Manure adds warmth to the soil, increases its absorptive power and improves its tilth. Commercial fertilizers supplement manure by supplying the available plant foods needed to ensure rapid growth, good quality and early maturity.

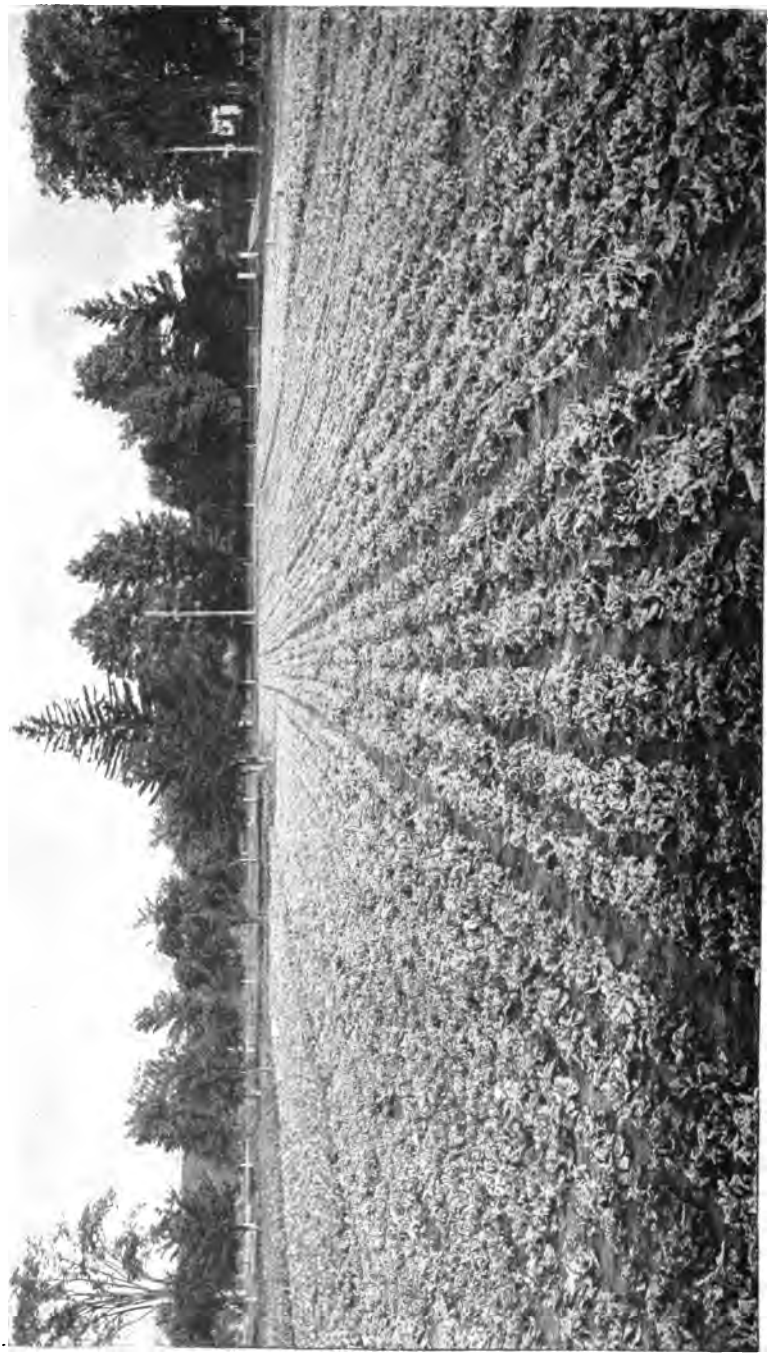
THE IMPORTANCE OF CROP-PRODUCING QUALITY IN FERTILIZERS

A study of fertilizers and their effects shows that the sources of the plant foods are of as great importance as their employment in the right proportions.

Special fertilizers usually best

The grower should bear in mind that only fertilizers prepared with a knowledge of the crops and of the general character of the soils for which they are intended can meet the requirements of the crop in the most economical way. This is because each crop has its special requirements in respect to the form and proportions of its foods, and each soil has its particular deficiencies which must be supplied. Some crops require a large quantity of ammonia and little phosphoric acid, while other crops require much more phosphoric acid and less ammonia. There are also crops which do best when ammonia is supplied to them gradually and other crops that need a large amount of available ammonia in a short time. These crop requirements must be considered in conjunction with the deficiency or richness of the soil in selecting the proper fertilizer to use.

An "all-crop" fertilizer for general use may give satisfactory results in some cases, but it is generally better to use the special formula made for a special crop by men who know its needs.



A Field of Lettuce at Lexington, Massachusetts, grown with our fertilizer.

Government recognizes quality

The importance of crop-producing quality in fertilizers cannot be emphasized too strongly. It is important that fertilizers should measure up to a high standard in chemical tests, but it is even more important that they should give good crops, for the field performance is the real criterion by which their value should be judged.

In a bulletin of the United States Department of Agriculture the following comment is made regarding fertilizers: "The difference between a good brand of fertilizer and a poor one, lies not so much in differences that may exist in the total amount of plant food contained in it, as in the quality of the material of which it is made."

Quality important, say experts

The late Sir John B. Lawes, England's great agriculturist, said: "The difference in form in which these substances, potash, phosphoric acid and nitrogen are met with, greatly affects their value. The present method of analyzing fertilizers does not properly recognize these distinctions, and the valuations founded upon these analyses are altogether false and erroneous."

The first Director of the Connecticut Agricultural Experiment Station, Professor W. O. Atwater, afterwards in charge of the Federal Office of Experiment Stations, said: "It is impracticable to estimate the agricultural value of a fertilizer from its chemical composition. An unfortunate tendency of money valuations is to call attention away from the composition of the fertilizer, which is the important matter, and direct it to a standard which is often of doubtful accuracy, if not positively wrong. As a result, not only does the farmer get wrong impressions in place of right ones, but honest dealers are harrassed, and sometimes pecuniarily injured, by incorrect valuations of their wares."

Other high authorities express similar views.

Fertilizers for all crops

Our line of fertilizers is complete, it includes formulas for all crops, and the knowledge gained through sixty years of experience stands back of them. We have fertilizers which contain the plant foods in the right proportions and in the best forms for profitable crop production on your soil. If you are in doubt what brands are best adapted to your particular crops and soil we shall be very glad to assist you in making a selection.

We do more than the law requires

State laws require a guaranty of a certain amount of plant food according to chemical tests. We not only endeavor to meet this requirement, but we set for our fertilizers a standard higher than that set by the State.

HEAVY BUT JUDICIOUS FERTILIZATION PAYS

How much fertilizer to use

There is a diversity of opinion regarding the quantity of fertilizer per acre which can be used most profitably. The standard for grain in the Middle West is 200 to 400 pounds to the acre, and for potatoes, sugar beets and truck crops from 500 to 2,000 pounds to the acre. In the Eastern part of the country where the soils are naturally poorer, 2,500 pounds of fertilizer to the acre are sometimes used for a single crop of tobacco, potatoes, onions or other vegetables. In Florida, where two or more crops are grown in a year, 3,000 pounds or more of fertilizer to the acre can often be used advantageously. We know of a Florida tomato grower who, by raising his application from 3,000 pounds to two tons to the acre, secured a sufficient net return from the last increase to pay for all of the fertilizer used on the field. In general, the best and most economical way is to fertilize liberally and thus ensure good results. It is a good plan to figure out the requirements of crops, based upon all the scientific knowledge available, and then use enough fertilizer to fully meet their needs.

Different forms of plant food needed

In order that his crops may have plenty of suitable food at all times, the well-informed trucker uses fertilizers which contain plant foods in both immediately and gradually available forms and from several different sources.

Methods which ensure success

The crop which secures a vigorous start through careful preparation of the soil, which is nursed by diligent cultivation and which is abundantly fed with good commercial fertilizer, is usually the first, or at any rate the best, in the market. The grower of crops of high quality not only secures better prices, but, in the case of extra early crops of certain kinds, he often has his returns in the bank before his less progressive neighbor begins to make shipments.

A full crop on every acre

The experience of our sales department shows that almost invariably the grower who uses enough fertilizer to amply meet the needs of his crops, is the first to retire his obligations to us. He knows that true economy lies in making every acre produce the best crop it can be made to yield, and he fertilizes with this end in view.

Feed the crop rather than the soil

Attempts to supply soil deficiencies, as determined by a chemical analysis of the soil, without reference to the kind of crop to be grown, are no longer considered practical; nor can the growth of a given crop for a single year be relied upon as a guide in fertilizing all kinds of plants.

A potato-harvesting scene at Hastings, Florida. The modern truck "brings all farms near the railway station."

Know needs of crop and soil

In plant feeding we must study the individual needs of each crop, taking into account also what has been learned concerning the deficiencies of the soil. By doing this we can supply, in the best proportions, the plant foods which the particular crop requires.

NEW AND IMPROVED METHODS OF APPLYING FERTILIZERS

Machinery saves time and money

Fertilizers give the best results when they are mixed thoroughly with the soil. Time and money can be saved by the use of machinery in applying them. Most modern seeding machinery can be fitted with fertilizer attachments at small additional cost.

If large quantities of fertilizer are to be applied broadcast, for harrowing into the soil or as a top-dressing, a fertilizer distributor designed especially for the purpose is the best type of machine to employ. Where smaller quantities are to be broadcasted, a grain drill equipped with a fertilizer attachment can be adapted to the purpose by either of the following methods: (1) The shoes or discs and the hose pipes are removed and the

fertilizer allowed to fall directly upon the ground. (2) Short hose pipes may be used to drop the fertilizer upon a long board, which is swung underneath the machine. This board should be inclined to the rear in such a way that the fertilizer will fall on the board above the center and be well distributed by the shaking of the machine before it drops off the edge.

If it is desired to distribute the fertilizer and work it into the soil, in one operation, one may use a regular grain drill equipped with a fertilizer attachment. In the case of a single disc drill, the best distribution is secured by using a set of extra long delivery tubes, which must be ordered especially from the manufacturer. These tubes are held in place by suitable clamps, and conduct the streams of fertilizer in such a way that they will either be split by the front of the discs or drop just in front of them on the side toward which the earth is thrown.

IMPORTANT TYPES OF FLORIDA SOILS

Pinelands The State Geologist, E. H. Sellards, estimates that 75 per cent. of the land in Florida was originally covered with pine trees. This accounts for the application of the term "pinelands" to extensive areas in the interior of the State.

High pine and high hammock lands The high pinelands, covered originally with pines, have a deep topsoil and are underlaid by a clay subsoil which occurs at varying depths in different localities.

The high hammock lands were formerly covered with hardwood deciduous trees. Their deep topsoil is underlaid in some places by shell or marl and in other places by almost pure sand. Due to the presence of organic matter, the top layer of these soils is usually very dark, but as the depth increases the organic matter becomes less. Where the subsoil consists of sand the furrow method of irrigation can not be used successfully.

Palmetto and prairie lands The palmetto and prairie lands are generally level and poorly drained, but are better than the other "flatwoods." The palmetto type has invariably a hardpan layer from 1 to 4 feet in depth, and the open flatwoods almost always have a clay subsoil. In the Sanford and Hastings districts these types of soil, under irrigation, are used extensively for trucking.

"Glade" soils On the lower East Coast, most of the large truck farms in Dade County are located on "glades" or dead creek beds, which are of variable character and are ordinarily flooded during

Loading potatoes for the Northern market at Hastings, Florida.

the rainy season. Usually the topsoil is underlaid at varying depths with marl or white clay, and sometimes marl appears even in the surface soil. These lands are planted in the spring after the water drains off or evaporates.

Muck lands Large areas of muck land are now being brought under cultivation and, although these soils do not require complete fertilizers, they respond well to certain mineral fertilizers. Such fertilizers, if properly proportioned, are more profitable on this soil than on land not naturally so fertile.

Low hammock and cabbage palmetto lands fine for trucking The low hammock and the cabbage palmetto lands, due to the heavy expense of clearing and draining, are used but little for vegetables, although well adapted to them. These soils are well supplied with humus, are far richer in phosphoric acid and potash and hence are better balanced than the muck lands. They should therefore become eventually the most productive lands in the State.

Florida soils afford great opportunities The opportunities for making money by the cultivation of Florida soils are practically unlimited. Nowhere will intelligent effort win a more generous reward or fer-

tilizers produce a more profitable increase. Unfortunately many a grower, due to neglect, lack of proper management, failure to use enough fertilizers or to apply them properly, fails to earn the profits which he should.

The Florida trucker uses more fertilizer but less manure than the Northern market gardener

If it were possible for the Florida farmer or trucker to secure as much manure as is used by the Northern market gardener, he could produce his crops with less commercial fertilizer. It must not be forgotten, however, that while the Northern grower is producing one or possibly two crops a year, the Florida grower is producing two or three. The Florida trucker is less likely to lose plant food from his soil by leaching, since the land is occupied by crops for the greater part of the year. He can, therefore, produce relatively more for the fertilizer used, than the grower in the North.

THE IRRIGATION OF TRUCK CROPS

Why irrigation is necessary in Florida

Irrigation is necessary in Florida, not because of a deficiency in rainfall, but because of its uneven distribution. Since crops are grown throughout the year, a regular supply of moisture from a natural or artificial source is essential. A drought of even short duration may result in serious loss to the trucker. If the rainfall is light the plants will derive but little benefit from it, unless the land is irrigated shortly afterwards. In the production of truck crops heavy fertilization is necessary, but this is of little avail if the soil contains insufficient moisture.

Some crops and soils need less water than others

Soils which are low, heavy, or underlaid by clay do not need as much irrigation as those which are high, sandy, or underlaid by sand or gravel. Shallow-rooted crops generally require more frequent irrigation than those which have a deeper and more extended root system.

Field crops neither irrigated nor intensely cultivated

The common field crops of Florida are seldom irrigated for the reason that they are grown chiefly in the northern part of the State, where the rainfall is fairly even, or in the southern part during the rainy season, after the truck crops are harvested. Field crops fortunately do not require the same intensive methods of cultivation as truck and citrus crops.

Soils of the Sanford district

The soils in the Sanford district are mainly of the "flatwoods" type, although there is some low hammock land. They are underlaid by a stratum of clay or hardpan, which appears to be cemented by organic materials containing large quantities of iron. In this section water for irrigation is obtained from flowing wells which vary in depth from 95 to 300 feet.

Flowing wells

The cost of flowing wells depends upon their size and depth. A 3-inch well costs in normal times about $1.25 per foot complete. The total cost of a 2-inch well supplying from 30 to 80 gallons a minute is approximately $60 to $70. Usually from 2 to 5 acres can be irrigated by one well, the exact area depending upon the character of the soil and the flow of water. Generally a number of 3-inch wells are better than one 4-inch or 6-inch well, particularly where rapid irrigation is desirable.

The Sanford system of irrigation and drainage

In the Sanford district subirrigation is practiced by allowing the water from the wells to flow into underground tile and escape into the soil through the open joints. The tile are placed in parallel rows 18 to 20 feet apart. In the wet season or following an excessive rainfall they serve as drains. Since it is as important to get rid of an excess of water as to supply it when needed, the Sanford system of combined subirrigation and drainage has much to commend it in addition to its effectiveness, cheapness, and low cost of maintenance. Most of the crops raised in the Sanford district are shallow-rooted, feeding chiefly within 10 inches of the surface. This is important because deep-rooting plants would choke the tile.

Hastings open-ditch irrigation

In the Hastings district, the largest irrigated area in Florida, the open-ditch method of irrigation is generally practiced, and nearly two-thirds of the potato crop of the district is irrigated in this way. The soil conditions and water supply resemble those about Sanford, excepting that the pressure of the water from the flowing wells at Hastings is less. The 4-inch wells supplying about 300 gallons per minute are more popular than the 3-inch wells. These larger wells cost from $1.50 to $2.00 per foot complete. Water is reached at varying depths seldom exceeding 150 feet.

Open-trough irrigating system

Some farmers irrigate by means of an open trough, or flume, instead of tile. In this system the water flows in only one direction. The open-trough system is used in many parts of Florida where the water in the flowing wells does not rise sufficiently high to give an adequate head for subirrigation.

The open-ditch system In the open-ditch system the water from the wells flows into a main head ditch, and from there into the field ditches, controlled by simple wooden gates or dirt embankments. These field ditches are kept filled until the soil between them becomes saturated. In case of a protracted drought the wells are run continuously. One well irrigates about 40 acres. Some years no irrigation is needed, whereas in other years it is required during the greater part of the growing season.

The furrow system In the furrow system of irrigation the water runs in open ditches and between the rows. The flow is regulated by a shovelful of earth placed at the head of each furrow. This system would be more popular if it permitted a better distribution of the water, yet its possibilities are worth considering.

The overhead systems Both overhead parallel pipes with nozzles and upright pipes with revolving heads are used extensively in irrigating. It is estimated that more than 3,000 acres of land in Florida are irrigated in this manner. In the most common overhead system the water is conducted through parallel elevated pipes supported 6 to 7 feet above the ground by posts set 15 to 20 feet apart. The water issues from these pipes through brass nozzles which are placed 3 to 4 feet apart. Each line of pipe is so arranged that it can be rolled in bearings in a turning union by means of a lever. Thus when any pipe is turned in a given position, the water from all of the nozzles is forced out at the same angle. Each parallel pipe line is attached to the main supply pipe, which in turn is connected with a pumping outfit by means of which the water pressure is maintained at 30 to 40 pounds to the square inch throughout the entire system. This pressure is sufficient to throw the water 25 feet from the nozzle. The nozzles range from a quarter to half an inch in length and have an outside diameter no larger than a lead pencil.

Advantages of overhead irrigation The chief advantages of systems of overhead irrigation are the ease of operation, the saving of manual labor and the rapidity and evenness with which the water is distributed. The last feature is especially important where plants have just been transplanted. Irrigating plants with a spray often protects them from frosts and it also removes dust and plant lice.

By the overhead system of irrigation water can be applied frequently and with little danger of loss by leaching. This renders the overhead system particularly advantageous for the open sandy soils of Florida, which dry out rapidly.

Cost of overhead systems

The cost of constructing a system of overhead irrigation ranges from $200 to $500 an acre, but this is more than offset by the subsequent saving of labor.

Skinner-Stephens irrigation system

The Skinner-Stephens system of overhead irrigation is radically different from the others, for the nozzles are mounted on a pipe which, in the case of an acre unit, is 200 feet long. This pipe, the ends of which are supported by a wire truss, is revolved about its center by the pressure of water escaping from the nozzles. A single pipe of this kind will irrigate a circle about 250 feet in diameter.

Advantages of Skinner-Stephens system

The manufacturers of the Skinner-Stephens system claim that it is a great improvement over others, and that with a power plant of a given size it will irrigate an area four times as large as can be irrigated by any other system. Less piping is needed, a smaller engine will answer, and the operating costs are lower. Another important advantage claimed for the Skinner-Stephens system is that only one post is required for an acre unit, whereas other systems require from 50 to 70 posts.

CROP ROTATION AND ANIMAL HUSBANDRY IN CONNECTION WITH TRUCKING

Wide-awake truckers and general farmers have learned that it pays to practice a suitable, systematic rotation of crops, and that it is better to follow a truck crop with a legume than to allow the land to revert to weeds and grasses.

Potatoes in rotations involving animal husbandry

The potato growers of the Hastings district began long ago to plant corn for grain and for forage. After the ears are gathered, the stalks are dragged down, cut up with a heavy disc harrow and plowed under to increase the supply of humus. Cowpeas or velvet beans are then planted. Para grass, which thrives on soil adapted to potatoes, might be introduced at this point for two or three years for pasture purposes. If such a system is followed for a few years, a light sandy soil is changed gradually into a sandy loam of much higher productivity. After such improvement larger quantities of fertilizer can be used with profit, and the increased yields of potatoes lessen materially the cost of production per bushel. By such rotative cropping the injury by plant diseases and insects is greatly lessened.

PART TWO

INTRODUCTORY NOTE

This division of the book is in three sections: the first relates to truck crops, the second to summer and staple crops and the third to home garden crops.

Florida lands now devoted to both truck and staple crops

All three sections of the book should be of interest to the Florida trucker, who no longer confines himself solely to the production of truck crops. Not long ago truckers in the Sanford district devoted themselves almost entirely to the culture of lettuce and celery, but now practically every acre is cultivated throughout the year. In the Hastings district where Irish potatoes are grown as a winter crop, we find the greatest development of intensive agriculture. Our matchless winter climate offers such great possibilities for the growth of truck crops that we have been slow to appreciate the advantages of Florida for the production of staple crops and for the systematic development of animal husbandry.

Diversification of crops is good policy

Since many of the so-called "money crops" of Florida which grow during the winter season are extremely speculative, it is obviously good policy for the trucker to grow during other seasons crops of a less speculative character.

SECTION ONE: TRUCK CROPS

BEANS

VARIETIES.—THOUSAND-TO-ONE REFUGEE—popular market variety; round, long, light green pods; good for early or late planting; yields abundantly. EARLY REFUGEE—very early bush variety; round, light green pods; fleshy, brittle, mild flavor. BLACK VALENTINE—early-maturing, hardy, rust-resistant; round, straight, green pods; good for early and late planting and for Northern and local markets. HODSON WAX—vigorous, blight-resistant, late-maturing; long pods; tender, brittle, fine quality. DAVIS KIDNEY WAX—vigorous, prolific; long, straight, yellow, waxy pods; a good shipper. GERMAN BLACK WAX—earliest wax bean, very productive; yellow, fleshy, stringless pods; fine flavor; very marketable.

SOIL.—The bush, string or snap bean grows rapidly and does well in Florida. Sandy loam soils, and loose mucks which are not too wet, are suitable for beans. The mucks are particularly adapted to the early winter crop.

PREPARATION OF SOIL.—Plow the land two ways unless it is in sod, and harrow thoroughly. String beans especially need lime on quite acid soils, whereas the lima bean is less in need of it.

FERTILIZATION.—Fertilizer should be used at the rate of 800 to 1,000 pounds to the acre. It should be applied in the furrows before or at the time of planting. When the plants are well leaved out, an additional 800 to 1,000 pounds of fertilizer to the acre may be applied beside the rows about 6 inches from the plants. In some sections growers apply all the fertilizer before planting, in which case from 1,600 to 2,000 pounds to the acre are used.

PLANTING.—In most of Florida, beans are planted from March to May and in August, although in the warmer sections they are planted earlier in the spring and later in the fall. In such sections they may be planted in the home gardens practically every month in the year excepting June and July. Some growers plant every week, for a period of twelve weeks. Beans mature sufficiently for sale as string beans in about six weeks.

The rows or furrows should be from 2½ to 3 feet apart, and the beans should be dropped 1 to 3 inches apart in the furrow, depending upon the character of the soil and the variety of beans. Some farmers open the furrow, apply the fertilizer by hand and cover it before planting the seed, but it is more economical to use a combined seed and fertilizer drill which opens the furrow, mixes the fertilizer with the soil, makes the bed, drops the seed and covers it, all in one operation.

CULTIVATION.—In order to conserve moisture and keep down weeds, one should begin to cultivate as soon as the plants have formed two leaves. Remember that beans will be seriously injured if cultivated or hoed while moist. They should receive shallow cultivation every week until the pods begin to form.

INSECTS and DISEASES.—Injurious insects and methods of control: CABBAGE WORM and ROLLER WORM, spray with arsenate of lead or Pyrox; CUTWORM, use poison bait. Important diseases and their treatment: MILDEW, dust with lime and sulphur at about the blooming period and after the first picking, or spray with bordeaux mixture; "BLIGHT" and "RUST" or ANTHRACNOSE, spray with bordeaux mixture or Pyrox.

PICKING and PACKING.—String beans should be picked every 3 to 5 days. After careful culling they should be packed tightly, without bruising, in well-ventilated bushel crates or hampers. Well-filled crates bring the highest market prices.

NAVY BEANS

Navy beans, one of the most important crops grown in the United States, should be planted as a money crop in Florida. They are grown extensively in the pine barrens of Michigan where the sandy soils resemble many of those of Florida. The crop report of the United States Department of Agriculture for July, 1917, shows that the State of Michigan produced 8,287,000 bushels of navy beans on 639,000 acres—an average of about 13 bushels to the acre. A navy-bean crop of this size would net Florida growers approximately as much as the entire orange crop.

In Florida navy beans should be planted in February. The crop can then be harvested during the dry season, between April 1st and May 15th. Sometimes a second crop of beans can be planted successfully in June or July, but it will not prove profitable in case of a severe and protracted rainy season, for beans are unusually subject to attacks by fungous diseases and weevils.

Navy beans mature in 80 to 90 days, and a yield of 8 to 10 bushels to the acre may be reasonably expected. The NEW YORK PEA BEAN is the most popular variety, but in some markets, including Boston, the CALIFORNIA MARROW BEAN sells better. Both varieties are grown extensively in California. One should follow the methods of planting, cultivating and fertilizing recommended for snap or string beans (page 26).

BEETS

VARIETIES.—The ECLIPSE—handsome, globular, good quality and color. This is replacing the EGYPTIAN, formerly the popular variety. LENTZ EXTRA EARLY BLOOD TURNIP—a leading variety; good size and quality; small tops.

SOIL.—On account of their long tap roots, beets grow well only on deeply worked, mellow soils. If the soil is acid, it should be well limed. Beets are now grown extensively in the Sanford district as a money crop and can be produced profitably in other sections.

FERTILIZATION.—From 1,000 to 2,000 pounds to the acre of good fertilizer should be used, according to the condition of

the soil. The fertilizer may be applied as directed under "Planting," or it may be strewn along the rows about ten days before seeding. Usually an additional application of suitable fertilizer is made when the beets are 1½ to 2 inches high, and often a third or even a fourth application is beneficial.

PLANTING.—Young beets are destroyed by severe frosts; hence it is a good plan to have them follow a so-called "fall crop" of lettuce. The seed should be planted about a quarter of an inch deep in rows suitably spaced for horse or hand cultivation. After marking the furrows with a plow, the fertilizer is scattered in them and covered by furrows thrown from both sides. The ridge thus made is then flattened with a roller and the seed is sown on the flattened surface with a garden drill.

CULTIVATION.—Very shallow cultivation should be practiced to keep the soil from crusting, and the rows should be kept free from weeds. One bar plowing, two cultivations and one hand hoeing are usually sufficient.

INSECTS and DISEASES.—For LEAF SPOT, spray with bordeaux mixture every ten days to two weeks. If beets are grown where previous crops of scabby potatoes have been produced, they are also likely to develop SCAB. Other crops should therefore be grown on such soils.

PACKING and SHIPPING.—Early beets are usually shipped when they are tender, immature and only 2 to 3 inches in diameter. Generally the leaves are trimmed to within 3 inches of the roots and the beets packed neatly and closely in well-ventilated barrels covered with burlap. The best prices are usually obtained if the beets are put up in bunches of four to six with the tops tied together.

CABBAGE AND CAULIFLOWER

VARIETIES.—Cabbages: JERSEY and CHARLESTOWN WAKEFIELD—popular; solid, erect, uniform heads; vigorous. EARLY FLAT DUTCH—strong, vigorous; thick, flat heads, large and solid, but not coarse. SUCCESSION EARLY—large to medium-sized heads, firm and solid; very reliable. FLORIDA DRUMHEAD—popular, particularly on light land. SURE CROP—late; suited to heavier soils.

Cauliflower: Standard for Florida: EARLY DWARF, ERFURT, EARLY SNOWBALL and EXTRA EARLY PARIS.

SOIL.—Cabbage and cauliflower are closely related and their cultural treatment should be similar. Both thrive in practically any friable soil, provided it contains a reasonable amount of humus. Cauli-

flower is more sensitive than cabbage to extremes of heat and cold, and it requires more moisture and a slightly heavier and richer soil.

These plants respond well to liming on moderately or quite acid soils.

PREPARATION OF SOIL and PRELIMINARY FERTILIZATION.—Thorough preparation of the soil is essential. Plow the field two or three times and harrow until it is in good condition. Lay off the rows 2½ to 3 feet apart, and a week or ten days before transplanting drill in 1,000 pounds of fertilizer per acre.

FERTILIZATION.—When the plants are four to five weeks old, and again as the heads begin to form, drill in an additional 400 to 600 pounds of fertilizer to the acre. Sometimes the last application is supplemented by 200 to 300 pounds of nitrate of soda.

PLANTING.—In northern and central Florida cabbage seed should be sown from September to February, and cauliflower seed from September to October for the early crop, and in December and January for the late crop. In southern Florida both cabbage and cauliflower seed can be sown from September to February, depending on the weather conditions.

Have the seed beds well prepared and broadcast the seed after a moderate amount of fertilizer has been worked into the soil. If fertilizer is used later on the beds, do not strew it too thickly or growth will be retarded. Sow new lots of seed at intervals of seven to ten days, in order to have a succession of young plants. If necessary, thin out the beds.

SETTING PLANTS.—Select a cloudy day, if possible, for setting the plants. Make a hole with a small trowel or a dibble and set the plants down to the bud. Press the soil well about the roots and pour water *around* but *not on* the plants. Set early varieties about 18 inches and late ones about 24 inches apart in the row.

CULTIVATION.—Stir the topsoil and destroy weeds by cultivating lightly and by hoeing when necessary.

INSECTS and DISEASES.—CABBAGE WORM, spray with Pyrox; CUTWORM, use poison bait; HARLEQUIN BUG, spray with kerosene emulsion. FUNGOUS DISEASES, prevent by spraying with Pyrox or bordeaux mixture.

CUTTING and PACKING.—Cauliflower is mature when the heads are well rounded, or just before they assume a rice-like appearance. It should be gathered only on sunshiny days, as moisture causes decay in transit. Cut so as to leave about an inch of stalk

when trimmed to 3 rows of leaves. In packing tie the leaves over the tops of the heads to protect them and keep them white.

Cauliflower and cabbage are usually packed in barrels, although fancy varieties, particularly of cauliflower, are often shipped in crates or lettuce baskets. The container should be well ventilated, and the heads packed in each should be of uniform size and weight.

Send for our booklet "How to Get a Crop of Cabbage," which describes the up-to-date methods of Northern market gardeners.

CANTALOUPES AND WATERMELONS

VARIETIES.—Cantaloupes: IMPROVED ROCKY FORDS—blight- and rust-resistant, prolific bearer; fruit good flavor, light green flesh, netted skin, uniform in size; standard market variety. HAGENSACK—hardy and productive; fruit good size, round, heavily ribbed and netted, thick, firm flesh, excellent flavor. BURRELL'S GEM—very prolific; fruit oval and tapering, splendid flavor; good shipper.

Watermelons: TOM WATSON—fruit 18 to 24 inches by 10 to 12 inches, tough thin rind, deep red flesh, good flavor, brown tipped seeds; standard market variety. FLORIDA FAVORITE—fruit oblong, medium size, light and dark green stripes, crimson flesh, good flavor; very popular. KLICKLEY'S SWEET—fruit with tender, dark green rind, scarlet flesh, solid heart, superb flavor, crisp and sugary; very popular in home and nearby markets.

SOIL.—Cantaloupes and watermelons thrive well on a warm, light, sandy soil or on a moderately rich loam.

PREPARATION OF SOIL.—Plow the land several times, as deeply as possible without disturbing the subsoil, and harrow thoroughly. If the land is low, ridge for the hills, but otherwise lay it off in checks.

FERTILIZATION.—Fertilizer at the rate of about 1,000 pounds to the acre should be thoroughly worked into the hills. Then level the hills, add about 1 inch of soil containing no fertilizer, compact the soil, drop the seed, cover with soil containing no fertilizer and compact again. When the vines are growing well, make a second application of 500 pounds of fertilizer to the acre around or along the sides of the hills.

PLANTING.—Plant cantaloupes in rows 6 feet apart with hills 4 feet apart in the row, and watermelons in rows 8 feet apart with hills at intervals of 10 feet. Plant several seeds in each hill, covering lightly. Thin to 2 or 3 vigorous vines to the hill.

CULTIVATION.—Shallow but thorough cultivation is important in order to keep the soil open and well aerated. When the

vines are 3 to 4 feet long, nip off the ends to promote the growth of laterals. If too many melons have set, the removal of some of them will improve the quality and size of the remainder.

INSECTS and DISEASES.—Insect pests: MELON APHIS, apply tobacco dust or spray the under side of the leaves, using kerosene emulsion, Black Leaf 40 or other tobacco extracts; MELON BORER, controlled (1) by slitting the stem, removing the borer and heaping earth about the stem above the point injured, (2) by burying some joints of the runners in the soil so that new roots may form before injury is noticeable. For FUNGOUS DISEASES in general, spray frequently with bordeaux mixture or Pyrox; "DAMPING OFF," dust with flowers of sulphur when the vines are young, and maintain good drainage and clean cultivation.

PICKING and PACKING.—Clip cantaloupes when they are mature but not quite ripe. Grade the fruit carefully and pack in clean crates. Avoid bruising or rot will develop. Watermelons are usually shipped in car-load lots. Place straw at the bottom, sides and ends of the car. Pack the melons firmly to keep them from rolling about.

CARROTS

Carrots are grown extensively near Charleston, South Carolina, and they should be profitable in Florida, especially as a secondary crop in the Sanford district. They can be grown easily and cheaply and, if of good quality, there is a ready market for them.

VARIETIES.—HALF LONG SCARLET—an excellent variety. CHANTENAY, DANVERS and SCARLET HORN—also popular.

SOIL.—Carrots thrive best on a reasonably rich, deep and well-drained soil.

FERTILIZATION.—If carrots are planted on land which was well fertilized for a previous crop, such as lettuce or celery, about 1,000 pounds of good fertilizer to the acre should be sufficient.

PLANTING.—Sow the seed in drills 12 to 18 inches apart. Cover ½ to 1 inch deep. When the plants are well up, thin to 3 or 4 inches apart, unless the carrots are to be pulled while small, in which case the plants may be left nearer together.

CULTIVATION.—Since carrots start slowly they must be cultivated lightly and often, and must be kept free from weeds.

INSECTS and DISEASES.—The carrot is relatively free from diseases and insect pests. Combat insects by spraying with

arsenate of lead, or by using either Pyrox, or bordeaux mixture to which arsenate of lead has been added.

PICKING and PACKING.—Pull when well grown and while crisp and tender. Cut off about one-half the foliage, and bunch.

CELERY

VARIETIES.—GOLDEN SELF-BLANCHING—large, compact, solid stalk, golden yellow color; crisp and tender; standard variety for Florida. GIANT PASCAL, WINTER QUEEN and IMPROVED are less important.

SOIL.—Celery is one of the most profitable and difficult crops to raise. A rich loam, well supplied with humus, is best adapted to its culture. Low hammock or semi-muck soils are suitable, if they can be sufficiently drained. Although celery requires an abundance of water and it is practically impossible to grow it successfully without irrigation, good drainage is necessary.

PREPARATION OF SOIL.—Plow and prepare the field thoroughly. If the soil is quite acid, ground limestone or wood ashes should be applied and harrowed into the soil most thoroughly before the plants are set.

FERTILIZATION.—(1) When grown in rows, one ton of fertilizer to the acre should be applied in the furrow 10 to 14 days before the plants are set. An equal application should also be made 20 to 30 days after setting. A common practice is to use less fertilizer at a time and make applications every ten days to two weeks. If the plants begin to turn yellow, apply 100 to 200 pounds of nitrate of soda to the acre, taking care to have none of it fall on the plants. (2) If the plants are grown in beds, all the fertilizer should be applied when the soil is being prepared for setting. In this case use 2 to 3 tons of fertilizer to the acre.

SEED BED.—Prepare a deep, smooth seed bed and work in about a ton of fertilizer to the acre. Sow the seed reasonably thick in rows 6 inches apart and cover very lightly. Keep the surface of the soil moist until the plants come up. Sometimes this is accomplished by laying burlap upon the soil and keeping it properly moistened. Seed is sown in May or June for the early crop and in August or September for the late crop. The seed bed should be screened as a protection from cold and strong sunlight.

The plants in the bed should be thinned at an early stage to about 1 inch apart in the row. If they stand fairly near together, the roots will penetrate deeper and the plants will consequently suffer

Part of a ten-acre field of watermelons in a young orange grove at Arcadia, Florida. Our fertilizer was used at the rate of 400 pounds to the acre in the drill before planting. Cowpeas were plowed under the previous year. No other manure was used. The estimated yield was seven carloads on the ten acres.

less injury when removed to the field. If transplanting is done in the seed bed, it should take place when the plants are about 2 inches high, and they should be set about 1 inch apart in the row. Such transplanting results in the production of a larger number of fibrous roots, as a result of which the plants are injured less when transferred to the field. Clipping the tops of spindling plants makes them stronger and stockier.

Before the plants are set in the field, they are hardened gradually by exposing them to the sunlight for a longer time each day. Celery plants are ready for transplanting into the field when 5 to 7 inches high.

SETTING PLANTS.—There are two systems of arranging the plants in the field.

(1) The furrow system. The plants are set 4 to 6 inches apart in rows 24 to 32 inches apart. The positions of the plants in the row are located by a wheel marker, and a dibble is the most convenient tool to use in transplanting. About 60,000 plants are required to set an acre by this plan.

(2) The block-bed system. The field is laid off in beds 4 feet wide and the plants are set in the beds at intervals of 6 inches in rows 6 inches apart. Irrigation is especially imperative if this system of planting is followed, as more than 100,000 plants are grown to the acre. By this method twice as many plants can be blanched with the same expenditure for boards and labor, as by the single-furrow system.

CULTIVATION.—The crisp, tender quality of celery is a result of rapid growth induced by abundant plant food, ample water and frequent cultivation. The plants must not be disturbed while the ground is wet or while the leaves are moist.

BLANCHING.—When the plants are 10 to 12 inches high, the stalks should be blanched by placing earth, boards or a suitable kind of paper on either side of the beds or rows to keep out as much sunlight as possible. In the block-bed system, only the outside rows have to be protected. The blanching process usually requires from two to three weeks.

INSECTS and DISEASES.—Insects seldom cause much injury to celery. FUNGOUS DISEASES and means of control: BLIGHT, spray frequently with bordeaux mixture from the time of transplanting until blanching is begun, or, while the plants are small, Pyrox may be used instead of bordeaux mixture, particularly if the plants are attacked by injurious insects; "DAMPING OFF," dust with flowers of sulphur or spray with ammoniacal copper solution; BLACK ROT, avoid insofar as possible by clean cultivation.

CUTTING and PACKING.—Celery is ready for market when properly blanched. Cut from the beds and trim off all roots and yellow leaves. Cull carefully and grade into "fancy" and "choice." Celery running 48 to 72 plants to the crate is termed "fancy," and 72 to 96 to the crate is called "choice." Pack in celery crates, using the style most popular in the market.

CUCUMBERS

VARIETIES.—WHITE SPINE—prolific, very early; fruit long, slim, symmetrical and of a deep green color. EARLY FORTUNE—very early, very prolific; fruit medium size, good shape, glassy green. DAVIS PERFECT—popular variety, blight-resistant; fruit often 12 inches in length, slim, uniform, resembles hot-house fruit.

SOIL.—Cucumbers thrive best on a light, sandy loam, particularly when it is underlaid by a clay subsoil and reasonably supplied with lime. This crop requires an abundance of moisture.

A field of Florida cucumbers showing the method of planting.

PREPARATION OF SOIL.—Put the soil in good condition by deep plowing and harrowing. If the seed is to be planted in beds, make them about 8 feet wide.

FERTILIZATION.—A week or ten days before planting in beds, drill into the rows 500 to 1,000 pounds of fertilizer to the acre, and in addition use 1½ to 2 pounds in each hill. As soon as the plants commence to bloom, a second application of 200 to 300 pounds of fertilizer to the acre should be made beside the rows, and a week or two later a third application of a like amount is desirable. In order to further force the plants, two applications of nitrate of soda are frequently made at the rate of about 150 pounds to the acre, at intervals of two weeks. In fertilizing and planting, observe the same precautions that are mentioned in the case of melons (page 30).

PLANTING.—On the top of an eight-foot bed, lay out two rows 4 feet apart and plant the hills 3 feet apart in the rows. If level cultivation is used, make the hills 4 to 6 feet apart each way. Drop from 8 to 10 seeds in each hill, and when the plants are well up, thin out the weaker ones. It is a good plan to make two or more plantings at intervals of seven to ten days, in order to be sure of a crop even if one or more plantings fail.

CULTIVATION.—Cultivate frequently and lightly in two directions, especially after each rain. This lessens direct evaporation

and destroys weeds which would otherwise take up and rob the cucumbers of a large amount of moisture.

INSECTS and DISEASES.—The cucumber is very susceptible to diseases and insect attacks. INSECT PESTS and means of control: APHIDES (plant lice), dust the under sides of the leaves with powdered tobacco, or better, spray with whale-oil soap, Black Leaf 40 or other tobacco extracts (the aphis is not killed unless touched by the spray); CATERPILLARS and WORMS, spray with arsenate of lead or Pyrox. FUNGOUS DISEASES: prevent by spraying both sides of the leaves frequently and thoroughly with bordeaux mixture or Pyrox from the time the plants have three leaves until growth ceases.

PICKING and PACKING.—In order to avoid injuring the cucumbers, cut them from the vine with clippers. Harvest every third day, for otherwise some fruit will be too ripe for shipping. Grade the fruit into "fancy" and "choice" and pack in bushel hampers. The "extra fancy" varieties frequently bring a much higher price if wrapped in paper and packed in tomato baskets.

CUCUMBERS FOR PICKLING.—The following article, from a leading magazine, calls attention to the big profits which can be made by growing cucumbers for pickling.

"About fifteen years ago a man in Somerset County, Maine, decided that a lot of pickles were eaten and somebody had to grow the cucumbers for them. He decided to try them as a crop and the first year he planted about a quarter of an acre. In the fall he pickled them in vinegar in half barrels. He tried the local market and found that he would have no difficulty in disposing of his crop. The first year he raised about one hundred bushels, including five sizes, and, in adding up his profits, found that they paid him better than anything else raised on his farm."

This grower found cucumbers so profitable that he specialized in them, and after fifteen years' experience he reported that cucumbers for pickles were more profitable than any of his other crops, including fruit.

EGGPLANT

VARIETIES.—NEW YORK IMPROVED PURPLE—prolific, spineless; fruit large, slightly round, deep purple, well shaped. BLACK BEAUTY—very prolific; fruit large. FLORIDA HIGH BUSH—tall, blight-resistant, very popular; fruit long. NEW ORLEANS MARKET—continuous, prolific bearer; fruit deep purple, uniform in size.

SOIL.—The eggplant grows best on a warm, moderately rich,

sandy or high hammock soil. It thrives on soil too dry for most other crops.

PREPARATION OF SOIL.—Put the soil in perfect condition by plowing thoroughly and harrowing two or three times.

FERTILIZATION.—Use from 1,500 to 2,000 pounds of fertilizer to the acre in two applications. Drill 1,000 to 1,500 pounds of it in the furrows a week or ten days before the plants are set, and apply the remainder when the plants are about 12 inches high. Nitrate of soda, applied frequently in small amounts, may further invigorate the crop and hasten the time when it can be marketed.

PLANTING.—Eggplants are sensitive to frost; hence, in the colder parts of Florida, the early spring crop should be started in hot beds or cold frames. The seed is broadcasted or sown in rows about 3 inches apart. The plants are thinned to about 1 inch apart in the row and later, before they become crowded, they are transplanted 2 inches apart in rows 4 inches apart. When 8 to 12 inches high they are set in the field. In southern Florida eggplants may be started in the field, but the seed bed must be screened somewhat from strong sunlight by cheesecloth or slats placed about a foot above the beds.

SETTING PLANTS.—In transplanting to the field, set the plants an inch deeper than they stood in the seed bed, press the earth firmly about the roots and then water. The plants should be spaced 2 to 3 feet apart in rows 3 to 4 feet apart.

CULTIVATION.—During dry weather give the field shallow cultivation about every ten days. During rainy weather cultivation should be deeper and more frequent.

INSECTS and DISEASES.—The eggplant is very susceptible to FUNGOUS DISEASES. By spraying repeatedly with bordeaux mixture or Pyrox, from the time the plants show three leaves until they begin to bear, one can usually keep them reasonably free from disease. INSECTS can be controlled by spraying with Pyrox or with arsenate of lead.

PICKING and PACKING.—The fruit is ready for shipping when it has lost its lustre and taken on a dull appearance. At this stage the seeds should be quite fully developed but not hard. When clipping, trim the stem close to the fruit. Cull and grade carefully. Wrap each fruit in paper, pack closely without bruising and have the fruit in each package uniform in shape, size and color.

LETTUCE

VARIETIES.—BIG BOSTON—hardy; heads solid and of high quality; good shipper. ROYAL—open ground variety; heads large, solid, interior blanched. HANSON—desirable for home garden; heads solid, cup shaped, mild and tender, uniform in size.

SOIL.—Lettuce thrives on any reasonably good soil, but it does best on rich loam or gray hammock lands. It grows especially well on celery soil, where it often precedes celery.

PREPARATION OF SOIL.—Put the field in good condition by plowing and harrowing, and lay it off in checks.

FERTILIZATION.—Before setting the plants or planting the seed directly in the field, drill in 1,500 to 2,000 pounds of fertilizer to the acre, and later make one or two applications of 200 pounds to the acre. At the last cultivation 150 to 200 pounds of nitrate of soda may be used to advantage.

PLANTING IN THE SEED BED.—Have the seed bed in perfect condition and protected from extremes of temperature. Fertilize moderately or enough to keep the plants growing vigorously. Sow the seed in rows about 6 inches apart and cover not over a quarter of an inch deep.

Ants often carry off the seed, but this can be prevented: (1) by digging a trench entirely around the bed and filling it with water; (2) by sprinkling the beds with "hominy grits" which the ants prefer to the seed; (3) by mixing the seed with moistened sand twelve hours before planting, since the ants will not molest germinating seeds.

TRANSPLANTING.—When the leaves are from 2 to 3 inches long, the plants may be set in the field in checks 12 to 18 inches square. Avoid setting the plants below the bud, compact the earth well about the roots and water liberally.

CULTIVATION.—Commence shallow cultivation when the plants are seven to ten days old and repeat frequently, in order to keep the soil loose.

INSECTS and DISEASES.—The CABBAGE WORM, spray with Pyrox or arsenate of lead; "DAMPING OFF," avoid by keeping the plants slightly hilled and the soil stirred up to the stalk, and if necessary dust the young plants with flowers of sulphur.

PICKING and PACKING.—When the heads are firm and solid, cut, remove all yellow, outside leaves and shake out sand and dirt. Lettuce is usually shipped in hampers containing a bushel and

a half. Pack in layers, alternating the ends, and press in firmly to compensate for shrinkage in shipping.

ONIONS

VARIETIES.—BERMUDA SILVERSKIN—desirable for the extreme southern part of the State. CRYSTAL WHITE WAX—a Bermuda variety, satisfactory for northern Florida.

SOIL.—Onions grow best on heavy black loams in fields that have been well cultivated and are free from weed seeds. The low hammock and especially the cabbage-palmetto hammock lands, when cleared, drained, and properly tilled, are admirably adapted to onions.

FERTILIZATION.—In order to grow onions profitably, they must be well fertilized. Ground limestone at the rate of 2 to 4 tons to the acre will be needed if the soil is very acid, or the lime may be supplied by using 1¼ tons of the best grade of wood ashes in place of each ton of the ground limestone. Wood ashes also contain some potash and magnesia and a little phosphoric acid, all of which may be helpful.

Several weeks before planting in the field or setting out the onions, work into the soil half a ton to the acre of castor pomace, which will act as a fertilizer and is said to destroy cutworms. Stable manure may be applied also, but only the well-rotted material should be used since it is more available, contains fewer weed seeds and is less likely to cause destruction of nitrates in the soil than the fresh material. A week or ten days before planting, harrow into the field a ton of good fertilizer to the acre.

PLANTING.—Some growers plant the seed directly in the field, whereas others plant in beds or boxes and transplant the onions when about six weeks old. Transplanting costs about $20 per acre, but it increases the size of the onions and eliminates the early weeding and thinning.

Onions should be set about 3 inches apart in rows which are 12 inches apart for hand cultivation and 24 inches apart for horse cultivation. It is not usually considered good practice to sow onion seed broadcast in the field; nevertheless, one Florida grower who did so reports that there was scarcely a square inch of unfilled space in the field and that by using plenty of fertilizer he netted by this method $1,500 to the acre for three successive crops, even prior to the recent high prices.

Only the freshest seed should be used, and it should be planted between August 20th and October 10th.

CULTIVATION.—Onion fields should be cultivated to keep down weeds and conserve the soil moisture. As a rule, a small hand wheel hoe is used in cultivating, but the thinning and weeding in the row must be done by hand. In using the hand cultivator, care should be taken not to disturb the bulbs and not to work more than the surface inch of soil.

HARVESTING.—Onions should be pulled when most of the tops in the field have fallen over and dried considerably. Sometimes when the tops do not fall over as quickly as they should, they are bent down by rolling a barrel over them. This treatment generally hastens ripening, although it is not always very effective. If a soil is insufficiently supplied with either lime or available phosphoric acid, the necks tend to remain thick and green and the tops erect. A great deficiency of nitrogen or potash may also have a similar effect.

After pulling allow the onions to dry on the ground for a reasonable length of time. They should then be placed in shallow racks with slat bottoms which permit free circulation of air and rapid drying. The racks should be put where they are freely exposed to the air, but properly protected from the weather. When fully dried the tops may be wrung off and the onions graded by hand, or a topping and grading machine will perform the two operations.

If you intend to plant onions as a money crop, send for our little booklet "How to Get a Crop of Onions," which describes the methods of the best Northern market gardeners.

PEAS

VARIETIES.—Extra early peas are: DANIEL O'ROURKE, NONPAREIL, ECLIPSE and HANCOCK. For the early market and for canning, a variety should be selected which ripens as nearly at one time as possible.

SOIL.—For peas the soil should be high, warm and well drained.

FERTILIZATION.—Peas will need but little fertilizer on land where the previous crop was well manured or fertilized. It is a mistake, however, to assume that all soils are rich enough for peas. Ordinarily from 300 to 600 pounds to the acre of well-balanced fertilizer should be used.

PLANTING.—Although peas are generally grown for the early spring market, extra early varieties are now often planted very late for shipment in November, since the fall crop often pays better than the early one. The seed is sown quite thickly in deep furrows

and in such a manner as to make a broad, self-sustaining row. The rows should be about 4 feet apart and the seed should be covered about 3 inches deep.

INSECTS and DISEASES.—The pea is especially hardy. If attacked by fungous diseases or insects, spray with bordeaux mixture, Pyrox or arsenate of lead, as needed.

PICKING and PACKING.—Do not permit peas to reach their full size, but gather them as soon as they are reasonably well developed, and pack neatly.

PEPPERS

VARIETIES.—Sweet peppers: RUBY KING—vigorous, compact grower; fruit thick and tender. CHINESE GIANT—fruit exceptionally large, 4 to 5 inches across, uniform in size, sweet, mild flesh, deep green color changing to scarlet. LARGE BELL or BULL NOSE—prolific, early bearer; fruit medium-sized, scarlet, sweet flavored. "Hot" peppers: LONG RED CAYENNE—pods 4 to 20 inches in length, slender, twisted, deep green changing to bright red, very pungent.

SOIL.—Peppers can be grown successfully in any warm, light, moderately rich soil. If the soil is acid, it should be limed.

PREPARATION OF SOIL.—Deep plowing is essential, after which one should follow once or twice with the harrow. Lay off the land in furrows.

FERTILIZATION.—Before transplanting, distribute the fertilizer in the furrows and cover it lightly; but if the crop is grown directly from seed sown in the field, a combination seed and fertilizer drill should be used. In both cases use fertilizer at the rate of 1,000 pounds to the acre. As the pepper is a continuous bearer, it is advisable to apply 300 to 400 pounds of fertilizer to the acre every two weeks, from the beginning until the end of the cropping period.

PLANTING.—For the fall crop in the northern part of the State, sow the seed in the field in July and August. For the spring crop, the plants must be grown in the hotbed. In southern Florida the seed can be sown in the field from September to January.

SETTING PLANTS.—The plants, whether started in beds or in the field, should stand finally at intervals of 2 feet in rows 2½ feet apart.

CULTIVATION.—Cultivate the top layer of soil frequently until the last fruit has developed.

INSECTS and DISEASES.—BLACK ROT is the principal disease; spray with bordeaux mixture or Pyrox. CATERPILLARS and WORMS, spray with Pyrox or arsenate of lead.

PICKING and PACKING.—When the fruit is plump and sufficiently hard, cut it and cull carefully. If the price is high, pack in tomato baskets, but otherwise in bushel hampers. Pack tightly but avoid bruising.

POTATOES

VARIETIES.—SPAULDING'S ROSE No. 4—heavy yielder; tubers medium size, somewhat flattened or oval, medium to large eyes, light rose or flesh color; principal variety for Northern market. RED BLISS TRIUMPH—very productive, resistant to disease, matures early; tubers round and uniform, reddish, depressed eyes; standard Southern variety. IRISH COBBLER—vigorous; tubers cream white, excellent quality, ripen uniformly and early, keep well, desirable for best trade.

SOIL.—The potato can be grown successfully on a wide variety of soils, provided they are well drained. A light, sandy soil is desirable for early crops and a muck soil for late crops.

PREPARATION OF SOIL.—The soil should be prepared thoroughly by plowing to a depth of 8 to 10 inches—the deeper the better. Harrow two or three times with a heavy cutaway disc harrow, to ensure a well pulverized seed bed.

FERTILIZATION.—Successful growers use from 1,500 to 2,000 pounds of fertilizer to the acre. As the potato roots are short, the fertilizer must be placed near the seed tubers. Some growers advocate broadcasting the fertilizer, half at the last harrowing and half later. Most growers in the Hastings district apply it in the furrows and mix it with the soil a week to ten days before planting. Excellent results are obtained by applying 1,200 to 1,500 pounds to the acre in the drill at the time of planting, and 500 to 800 pounds more when the plants are well up. This latter plan is usually preferable on land having an open subsoil where plant food may be lost by leaching.

PREPARATION OF SEED.—Seed potatoes should be treated before cutting for the prevention of SCAB, BLACKLEG, and RHIZOCTONIA ("black scurf" or "rosette"), by one of the following methods:

CORROSIVE SUBLIMATE TREATMENT. Corrosive sublimate can be bought at drug stores in the form of crystals. Two and one-fourth ounces of these crystals should be dissolved in a few gallons

A part of five acres of eggplants on Terra Cera Island, Manatee County, Florida. The field was first planted to romaine, using one ton of our fertilizer to the acre, and produced 6,600 crates. The eggplants were fertilized at the same rate as the romaine. When photographed 4,500 crates had been harvested and 500 more were expected.

of hot water, and enough cold water added to make 15 gallons of solution; the whole should then be well stirred. In preparing the solution and treating seed potatoes, use only wooden vessels. Two barrels with wooden faucets are convenient, as the solution can be drawn from one to the other whenever it is desired to remove the potato tubers. If preferred, the potatoes may be put into sacks and placed in the solution. It is preferable to wash the tubers in water at the outset, but in any case soak them in the corrosive sublimate solution for 1½ hours (never for a longer time), then allow them to dry. Cut and plant as usual.

CAUTION.—Corrosive sublimate is a powerful poison, if taken internally. None of the solution should be poured out near wells or where farm animals can drink it, nor should the vessels in which the mixture is made be used for any other purpose. A solution of the strength mentioned will do no harm to the hands.

THE FORMALIN TREATMENT.—To 1 pint of fresh undiluted formalin (40 per cent. of formaldehyde), add enough water to make 30 gallons. Soak the tubers in this solution for 2 hours (never for a longer time); then dry, cut and plant. As a preventive of rhizoctonia the corrosive sublimate treatment is superior to that with formalin.

Potatoes that have been treated by either of these methods should never be put into any untreated box, barrel or sack that has contained untreated potatoes.

After treatment the potatoes should be cut, usually with two eyes to a piece, in such a way as to give the largest possible pieces. In order to prevent decay, wilting and the sticking together of the pieces, dust them with land plaster, flowers of sulphur or with both. If scab germs are present in the soil, use the sulphur. All seed tubers showing dark streaks or spots when cut, should be discarded.

Lime, barnyard manure and wood ashes promote scab if the germs of the disease are present in the soil or on the seed tubers. Treatment of the tubers will not prevent scab in soils already contaminated with germs of this disease. On such soils crops other than potatoes, beets or turnips should be planted. If potatoes are planted where the soil is badly contaminated, the seed should be treated with sulphur and, if possible, an acid fertilizer should be used. The germs of the disease have been known to exist for 18 years on the organic matter present in the soil, even when no potatoes, beets or crops susceptible to the scab had been grown in the meantime.

PLANTING THE SEED.—In the Hastings district practically all of the planting is done with machines. Generally a 7-point planter is used, which locates the hills 14 inches apart in the rows. Some growers use a 6-point wheel and put their hills only 10 to 12 inches apart. The seed should be planted about 3 inches deep in low or clayey soils and about 4 inches deep in light ones. On very heavy wet soils in a cold season the planting should be shallow.

A planter equipped with a fertilizer attachment can often be used to advantage, and in Northern potato districts they are used almost exclusively. This opens the furrow, distributes the fertilizer, drops the seed and covers it as fast as a team can walk. In the chief potato sections of the North, the practice formerly was to drop the seed at intervals of about 18 inches in rows 36 inches apart. This, however, produced over-sized tubers lacking in uniformity and of inferior market value. Much better results are now obtained by spacing the rows 32 to 34 inches and dropping the seed at intervals of 12 to 15 inches in the row. A larger amount of seed is needed in case of closer planting, but the increased yield of good-sized marketable potatoes makes it profitable, provided the land is properly fertilized. A few growers have planted the hills as close as 9 inches apart, but this is usually too close.

CULTIVATION.—Soon after planting, go over the whole surface of the field with a light spike-tooth harrow and a few days later with a weeder. During the growing period, a narrow weeder or

a riding cultivator should be used frequently between the rows until the plants begin to blossom. The potatoes should be hilled sufficiently to protect them completely from standing water, even if this involves ridging somewhat prior to planting.

INSECTS and DISEASES.—COLORADO POTATO BEETLE ("bug") and the FLEA BEETLE, spray with arsenate of lead or Pyrox. Early and late BLIGHT, spray early and frequently with Pyrox or bordeaux mixture; keep the foliage well covered with spray. DRY ROT FUNGUS, attacking first the roots and later the plants, grow grass and grain crops on the infected land for from 3 to 5 years. Avoid potato diseases by using only uninfected or treated seed, and by planting on uninfected land.

HARVESTING and PACKING.—Potatoes are sometimes dug by hand, but it is far more economical to use a good potato-digger, of which there are several excellent types. With such a machine, one man and a good team should be able to dig 6 acres a day. It is said that in the Hastings district more and better work can be done in a given time by one potato-digger, hauled by a tractor, than can be done by 40 men. The machine also causes less injury to the tubers.

After the potatoes have been dug, they should lie on the ground until thoroughly dry, unless there is danger of sun-scalding; if such is the case, the pickers must follow more closely after the diggers. After the potatoes have been graded they should be packed in well-ventilated barrels. This will prevent sweating and allow them to dry properly. The standard barrel used in marketing contains 2 bushels and 3 pecks.

NEW POTATO GRADES.—In order that potatoes, in the warehouse, may be used as security for loans under the Federal Reserve System, the United States Food Administration, in co-operation with the Department of Agriculture, has established official grades and regulations which must be adhered to strictly. These grades and regulations are as follows:

U. S. GRADE NO. 1.—"This grade shall consist of sound potatoes of similar varietal characteristics, which are practically free from dirt or other foreign matter, frost injury, sunburn, second growth, cuts, scab, blight, dry rot, and damage caused by disease, insects, or mechanical means. The minimum diameter of potatoes of the round varieties shall be one and seven-eighths (1⅞) inches, and of potatoes of the long varieties one and three-fourths (1¾) inches. In order to allow for variations incident to commercial grading and handling, five per centum by weight of any lot may be under the pre-

Spaulding Rose potatoes at Hastings, Florida, showing three rows of potatoes thrown together. This field received 2,000 pounds of our fertilizer to the acre, all of which was applied before planting. The photograph was taken one hundred days after planting and the yield was one hundred and two barrels to the acre.

scribed size, and, in addition, three per centum by weight of any such lot may be below the remaining requirements of this grade."

U. S. GRADE No. 2.—"This grade shall consist of potatoes of similar varietal characteristics, which are practically free from frost injury and decay, and which are free from serious damage caused by dirt or other foreign matter, sunburn, second growth, cuts, scab, blight, dry rot, or other disease, insects, or mechanical means. The minimum diameter shall be one and one-half (1½) inches. In order to allow for variations incident to commercial grading and handling, five per centum by weight of any lot may be under the prescribed size, and, in addition, five per centum by weight of any such lot may be below the remaining requirements of this grade."

NOTE.—"Potatoes of the U. S. Grade No. 1, unless shipped in bulk, should be placed only in new, clean sacks or barrels, which should be well filled, securely sewed or covered, and, in addition to any necessary statements or marks, should be plainly marked 'U. S. No. 1.' Containers of potatoes of No. 2 grade, also, should be plainly marked 'U. S. No. 2.'"

Seriously damaged potatoes are considered culls and should not be shipped. Potatoes less than 1½ inches in diameter are seldom desired on the market, except in the early part of the Southern shipping season, when they should be shipped as No. 3 grade.

Every grower interested in the production of potatoes should have a copy of our free book on potato culture. In it the latest methods of growers in the chief Northern potato-growing districts are described, and much other valuable information is given.

SUMMER OR BUSH SQUASHES

The summer or bush squashes can be produced cheaply in Florida. They are desirable not only for the home garden, but also in a limited way as a market crop in those parts of Florida where they can be produced at the right season for shipment to the Northern market with other vegetables.

VARIETIES.—The summer or bush squashes known as "SIMLINS" (also locally as "CIMMERLINGS") embrace the PATTYPAN or SCALLOP, CROOKNECK and PINEAPPLE (PINEAPPLE-SCALLOP) varieties. Of these, those known locally as SCALLOP EARLY WHITE BUSH and SUMMER CROOKNECK are the chief ones grown in Florida.

SOIL.—A sandy soil or preferably a good loam should be selected for squash, and if very acid it should be limed.

FERTILIZATION.—At planting time 200 pounds of good

commercial fertilizer, containing a fair to high percentage of ammonia and phosphoric acid and a high percentage of potash, should be used. In addition there should be worked into the hills a ton of stable manure to the acre. In applying the fertilizer one should observe the same precautions as in the case of melons (page 30). When the plants are about ready to bloom, 800 pounds of fertilizer to the acre should be applied over a considerable area around the hills, and somewhat later an equal amount should be applied in the same manner in order to carry the crop to maturity.

PLANTING.—On the lower East Coast, squashes are planted in November for the Northern market and picking is begun in about 70 days. In other sections the planting is done chiefly for local markets. It is begun in March and April and is often continued until September. When planting at this season, land should be selected which is not likely to be too dry. The ground should be ridged by turning two furrows together. The hills are located on the ridges, the bush squash being planted 3½ to 4 feet apart and the running varieties about 8 by 8 feet.

CULTIVATION.—Squashes may be cultivated in the same manner as cucumbers (page 35).

INSECTS and DISEASES.—SQUASH BUG, resistant to insecticides; hence controlled by picking eggs and bugs by hand, by trapping bugs under boards placed near the hills, or by covering the plants with mosquito netting. SQUASH-VINE BORER, to control, use one of following methods: (1) plant a few early squashes ahead of the main crop to attract the insects, and then burn the vines; (2) split the main stalk near the ground and remove the borer, then pack soil about the stem to a point above the slit so that new roots will be thrown out.

STRAWBERRIES

VARIETIES.—MISSIONARY and EXCELSIOR—good extra-early varieties. LADY THOMPSON and KLONDIKE—early. GANDY and AROMA—late. All these varieties are perfect or self-fertile and, if vigorous plants are selected, they will yield well in Florida.

SOIL.—A moist but well-drained, friable sandy or clay loam, containing plenty of vegetable matter, is excellent for strawberries.

FERTILIZATION.—About 800 pounds to the acre of good commercial fertilizer should be applied in the furrow before the beds are prepared. When the new leaves begin to appear, scatter about 600 pounds of fertilizer to the acre beside the rows and work it into the soil. Just as the plants are about to blossom another application

A field of tomatoes grown with our fertilizer at Sanford, Florida. One and one-half tons of our fertilizer were used to the acre in two applications and in addition 250 pounds of nitrate of soda. The yield was estimated at 700 crates to the acre of "fancy" tomatoes.

of 500 or 600 pounds of fertilizer to the acre should be made in the same manner, taking care not to scatter any of it upon the plants, particularly if they are wet.

PLANTING.—Make furrows 2, 3 or 4 feet apart and bed on these furrows. Flatten down the beds with a roller or other implement, but leave them slightly elevated or oval in form to ensure good drainage. On narrow beds one row of strawberries is set and on wide ones frequently two. In the latter case the rows should be located each 10 to 12 inches from the center of the original furrow which received the fertilizer. The plants should be set from 12 to 18 inches apart in the rows, so that sunshine can reach them on all sides. Before setting, the roots should be cut back one-third or less. The plants should not be set so deeply that soil can get into the crowns, and the roots should be in as nearly a natural position as possible.

CULTIVATION.—For strawberries plenty of water, a rich, well-fertilized soil and thorough cultivation are necessary. While the plants are small, cultivate frequently so as to maintain a loose surface mulch. As the plants grow older, cultivate less frequently and not so deeply.

Late in the fall mulch the ground between the rows with pine straw or other suitable material, to keep the fruit free from dirt and sand, and leave it until spring as a protection against frosts.

INSECTS and DISEASES.—THRIPS, spray regularly with a mixture composed of 1 pound of whale-oil soap, 4 gallons of water and half a pint of Black Leaf 40. RED SPIDER, spray with lime-sulphur. RUST and DIE-BACK are likely to develop if the growth of the strawberry vines is checked by wet weather, poor cultivation or lack of fertilizer; correct these conditions, insofar as possible, and spray with bordeaux mixture or Pyrox.

PICKING and PACKING.—Strawberries picked early in the day are firmer than those picked later. Take hold of the stem and pinch off the fruit without handling it. Undersized and defective fruit should be discarded or sold separately. If the berries are wet, allow them to dry before packing. Pack neatly in clean baskets and crates.

TOMATOES

VARIETIES.—The varieties of tomatoes grown vary according to the locality and the demands of the market. GLOBE—very productive; fruit globular, glossy rose tinged with purple; a good keeper. EARLIANA—very early and prolific; fruit scarlet, smooth. REDFIELD BEAUTY—fruit grows in clusters of three to five, glossy red; good shipper. STONE—fruit three to five in a cluster, large, smooth, scarlet, solid, firm-fleshed. JUNE PINK—fruit four to five in a cluster, medium-sized, round, bright pink; a good shipper.

SOIL.—Tomatoes are grown successfully over a wide latitude and on soils ranging from heavy mucks to light sands. Preference should be given to moist, well-drained soils, containing a moderate amount of humus. On soils containing either too much nitrogen or too little potash and phosphoric acid, tomato plants tend to run to vine and fruiting is delayed. Tomatoes grown on poor, light soils, if properly fertilized, are firmer, of better quality and more marketable than those grown on rich, heavy soils. Even on the poorer soils, successive heavy applications of fertilizers rich in nitrogen should be avoided after the plants have attained considerable size, or the tomatoes will ripen late. Liming often increases the growth and lessens the susceptibility of the plants to certain diseases.

PREPARATION and PRELIMINARY FERTILIZATION OF THE SOIL.—The field should be plowed deeply and the soil well pulverized. Two weeks before transplanting, furrows are opened about 4 feet apart and in these 1,000 to 1,200 pounds of fertilizer to the acre are scattered. This is then covered with a

Corn at Sanford, Florida, following a crop of celery and lettuce for which our fertilizer was used at the rate of three to three and one-half tons to the acre in six applications. A small amount of nitrate of soda was also applied for the corn.

light furrow turned from either side. This ensures a supply of plant food in the soil where it is most needed for the young plants.

SUBSEQUENT FERTILIZATION.—When the tomatoes are about an inch in diameter, a second application of 500 to 600 pounds of fertilizer to the acre is made beside the rows and covered with a light furrow. When the first tomatoes begin to turn white, a third application similar to the second is made. Care should be taken that the fertilizer does not fall on the plants and burn them.

SEED BED.—Seed beds for tomatoes should be prepared 4 to 6 weeks before the time for transplanting to the field. Select a moist, but not wet, soil and prepare it deeply and thoroughly. The seed bed should receive only half as much fertilizer to the acre as the field, in order that the growth of the young plants may not be checked upon transplanting. Tomato seed should be planted ¼ to ½ inch deep. Thin out wherever the plants are too thick to make a stocky growth.

SETTING PLANTS.—The transplanting should be done in the afternoon or on a cloudy day. Set the plants at intervals of 2 to 4 feet in rows 3 to 5 feet apart. After making suitable holes, pour

into each a pint or two of water, and set the plants up to the buds and at an angle so that roots will develop along the stem.

CULTIVATION.—The ground should be kept stirred to a depth of 2 to 3 inches. Plants trained to stakes can be cultivated on both sides of the row; but, if the vines are allowed to spread, subsequent cultivation is restricted to the outside of each two rows.

INSECTS and DISEASES.—FUNGOUS DISEASES, particularly prevalent during damp, cloudy weather: BLIGHT, RUST and SMUT, spray with bordeaux mixture or Pyrox. The TOBACCO WORM and the POTATO BEETLE, spray with paris green, arsenate of lead or preferably Pyrox. The TOMATO FRUIT WORM ("ant worm"), pick by hand or use poison bait.

HARVESTING and MARKETING.—Tomatoes for the Northern markets should be picked just as they turn pink, or in warm weather when they are still white but of full size. They should be handled carefully. As the tomatoes come from the field, cull and grade with respect to uniformity of size, shape and color. Wrap each tomato in paper, place in 4-quart tomato baskets and pack 6 baskets to the crate. Good, sound, well-shaped tomatoes running 144 to the crate are termed "fancy," and 180 to the crate "choice." It pays to ship only the best, as culls seldom return the cost of packing.

Send for our little booklet "How to Get a Crop of Tomatoes," which gives the up-to-date methods of Northern market gardeners.

SECTION TWO
SUMMER CROPS AND STAPLES

Some staple crops which should be grown in Florida during the summer months are discussed in this section of the booklet. These crops can be produced profitably on a general farm, or they may follow other crops on land devoted to trucking.

In addition to growing staple crops it will often pay growers to devote a portion of their cultivated land to pasturage for a sufficient length of time to produce a good sod. Such sod, turned under, will gradually change a thin, sandy soil into a fairly good sandy loam, which will respond far more profitably to commercial fertilizers.

CASSAVA

Cassava should be grown on every farm. The roots are rich in starch and serve as a nutritious, palatable food for all kinds of stock. Cassava is prepared for the table in much the same manner

as Irish and sweet potatoes. It can be grown more cheaply than corn.

SOIL.—Cassava can be grown on any good, well-drained land that is suitable for sweet potatoes.

FERTILIZATION.—Use about 800 pounds of good fertilizer to the acre.

PLANTING.—Before the occurrence of frost the seed stalks for spring planting should be cut, stored in piles and covered with straw and a little dirt, taking care to leave a small hole for ventilation. Prepare the ground in the spring as for corn, with the furrows 3 to 5 feet apart. Break or cut the cane into 4- to 6-inch lengths and drop the pieces about 3 feet apart in the furrows.

CULTIVATION and HARVESTING.—Do not cultivate cassava too deeply as the roots run close to the surface. Practice clean cultivation. After cutting the seed stalks for the coming year, the crop may be dug as needed for feeding.

CASTOR BEANS

This important crop which has long been grown successfully in a small way in Florida is now assuming new importance.

The quantity of castor beans produced in the United States prior to the war was never sufficient to supply the demand for oil for dyeing, medicine, lubrication and soap. The quantity of beans now imported from India amounts to nearly a million bushels per annum. Nevertheless, this supply in addition to our own has proved inadequate, for castor oil is now considered the only satisfactory lubricant for aeroplane engines. In order to meet this situation the Federal Government in the spring of 1918 contracted through various agencies to buy at a fixed price the crop of castor beans from 75,000 to 100,000 acres of land. The contract price to individual growers is $3.00 a bushel of 46 pounds, f. o. b. the nearest railway station. As a result, 32,500 acres of castor beans are said to have been contracted for in 1918 in Florida.

VARIETIES.—Some local growers claim that the best INDIAN seed is preferable since it contains a far higher percentage of oil than PALM CHRISTI, the variety commonly grown in Florida.

SOIL.—Castor beans can be grown on any well-drained Florida soil, even if it is sufficiently acid to interfere seriously with the growth of beets, spinach, lettuce, onions, asparagus and other crops. Never-

A celery harvest at Manatee, Florida. This crop was grown with 2,200 pounds of our fertilizer to the acre used in three applications, in addition to 1,500 pounds of manure, and lime in soft phosphate. The yield was at the rate of 750 crates to the acre. The crop was of the highest grade and brought $4.00 a crate.

theless, liming may be of at least indirect benefit to the crop if extreme acidity prevails. Lands adapted to the growing of corn, cotton and citrus fruits are especially suited to them.

PREPARATION OF SOIL.—The land should be plowed deeply and harrowed thoroughly to ensure a good seed bed, quick germination, vigorous growth and a good crop.

FERTILIZATION.—On good land it may be possible to produce a fair crop of castor beans without fertilizer, but in order to get heavy yields one should use, just before planting, from 400 to 600 pounds to the acre of a fertilizer adapted especially to their needs.

PLANTING.—Soak the beans about 24 hours in warm water to ensure quick and even germination, and plant the seed 2 inches deep at 4-foot intervals in the rows. Some growers plant three beans, two soaked and one unsoaked, in each hill, while others plant only two. The rows should be 5 to 6 feet apart with every ninth or tenth omitted in order to leave room for handling the crop. When the plants are 5 to 6 inches high, remove all but the strongest one in each hill.

Castor beans may be grown successfully in young citrus groves by planting two rows between each two rows of trees. Occasional "middles" should be left unplanted to permit the passage of a team when harvesting.

CULTIVATION.—Good cultivation is important and within a week or ten days after planting, the field should be cultivated with a weeder or other light implement. In general the cultivation is similar to that required for cotton or corn.

INSECTS and DISEASES.—The castor bean is practically free from attacks by insects and fungous diseases.

HARVESTING.—Ninety to one hundred days after the beans are planted, the first spikes or burrs begin to turn brown and are ready to be cut. Additional beans, which continue to mature until the plants are killed by cold weather, should be gathered every five or six days to prevent losses through shelling in the field or through molding in moist weather. In gathering the mature spikes, one should avoid injuring the blossoms or buds.

CAUTION.—Castor beans are very poisonous if eaten.

CORN

Much of the land in this country which was producing only 35 bushels of corn to the acre has been made to produce 60 to 80 bushels

by the liberal use of commercial fertilizers and by better methods of farming. This is analogous to the experience with various crops in Europe, where it has been authoritatively estimated that about half of the increase in farm crops in recent years has been due to the more abundant use of fertilizers.

VARIETIES.—MEXICAN JUNE—strong root and leaf system, endures great extremes of heat and drought; stalk large, rich in sugar, grows from 11 to 15 feet high; it is more valuable for forage than for grain and is recommended only for late planting. There is also a dwarf strain of this variety which is often planted in home gardens in the summer months for table use. There may be many other better local varieties.

It should be remembered that corn which grows well in one locality may not thrive in another; hence the best local variety should be selected. In attempting to improve the quality and productiveness of corn, one should choose a variety which is already well acclimated and adapted to the local soil conditions. If corn is grown for the grain, it is a greater mistake to send South than to send a moderate distance North for the seed, since corn from the South has a greater tendency to run to stalk at the expense of ears.

SOIL.—Sandy soils which contain silt or clay, or which are underlaid by a heavier subsoil are preferable for corn. In all cases the soil should be well drained. The maintenance of a good supply of humus in the sandy soils of Florida and of the South generally is especially important for the corn crop.

FERTILIZATION.—Corn responds quickly and profitably to fertilizer. On sandy soils which are naturally deficient in nitrogen, phosphoric acid and potash, corn generally requires a complete fertilizer. On account of the heavy rainfall in certain sections of the South, most of the nitrogen in fertilizers for corn should be present in organic materials, unless the fertilizer is used in two or three applications. The sources of the soluble potash and of the soluble and available phosphoric acid are relatively less important. On poor land where the plowing has been shallow, it is unwise to use more than from 400 to 600 pounds of fertilizer to the acre. In dry seasons 600 pounds may be too heavy an application; but if the soil is plowed deeply and is well supplied with humus, 1,200 to 1,800 pounds of fertilizer to the acre may be used to advantage. The fertilizer for corn on the poorer soils, should contain a high percentage of ammonia, a moderate to high percentage of phosphoric acid and a moderate percentage of potash. If a heavy crop of velvet beans, cowpeas or beggarweed was grown and turned under the previous year, the fertilizer may contain

A crop of millet at Manatee, Florida. Such a crop is a boon to the animal husbandman. Fertilizers by producing larger crops and more manure improve the soil, so that fertilizers will give still greater yields.

relatively less ammonia and more phosphoric acid than otherwise. When the corn is shoulder high or when it begins to tassel, cultivation should be discontinued.

CULTIVATION.—Before the corn is up the land should be harrowed with a light spike-tooth harrow or, if the soil is light and sandy, a weeder may be better. If this is done most of the small weeds will be killed and the young plants will have favorable conditions for growth from the outset. On medium or light soils the weeder should be used, once or twice, after the corn is up. The destruction of the weeds as fast as they germinate, by the use of such implements, is of the greatest economic importance.

When corn is two to three weeks old the roots are often 2 feet long and penetrate from 12 to 15 square feet of soil. By the time it is waist high, the roots practically fill the soil in every direction. It has been shown by Hunt and Morrow in Illinois that if corn is cultivated 2 inches deep at this later stage of growth, one-seventh of the roots are likely to be injured; hence only the surface soil should be stirred. If a weeder is not used after the corn comes up, cultivation should be commenced as soon as the rows are plainly visible. If the corn is planted in check rows, the second cultivation should be at right

angles to the first and should take place as soon afterwards as possible. The later cultivations should not only be shallow, but the shovels, blades or discs near the corn plants should be set to run less deeply than the others. If the soil is stirred too deeply, the roots will be injured and a large amount of moisture will be lost from the fresh soil which is thrown to the surface. During the wet season the objection to deeper cultivation on account of injury to the roots would be less serious and the greater drying out of the soil might be advantageous.

In some sections of the country the one-row or two-row surface cultivator which is fitted with leveler blades is used for the last cultivation, for it merely stirs the surface soil. Under certain conditions the mere dragging of a wheel from an old corn planter between the rows does this work most effectively and it may sometimes be employed even after the usual cultivation should cease.

Root pruning of corn by deep cultivation was once advocated, but it was found to do more harm than good excepting under the most favorable moisture conditions.

The two-horse cultivator which cultivates each side of a single row is usually far better than the type which is run between two rows. For large areas the riding cultivator is usually preferred, especially if it is of a type which can be guided accurately.

If harrowing is neglected before and after planting and if the first cultivation is delayed until the weeds are from one to three inches high, the cost of the hand-hoeing necessary to clean the field is likely to preclude all possibility of profit.

The attempt to conserve moisture by repeated late cultivation has been shown by the Illinois Agricultural Experiment Station to be uneconomical. After the corn is quite high, the water rising from the subsoil, as it does in times of drought, is absorbed so quickly by the great mass of roots near the surface that the loss by direct evaporation is almost negligible.

Cultivation of dent corn should cease by the time it is approximately 40 inches high or, in the case of flint corn, just as the first tassels appear.

By using enough horse labor to operate the gang plow, the large-section smoothing harrow, and the large disc harrow, and by following with the checkrow corn planter and two-horse cultivator, one acre of corn is carried to maturity in large fields in the Middle West with the expenditure of but one and one-half day's manual labor. Thus one man can care for from 40 to 60 acres in a season.

The Williamson method of corn culture (see full details in Bulletin 124, South Carolina Agricultural Experiment Station) involves the stunting of the corn plants from one-fourth to one-half by withholding all plant food until the second cultivation. The seed is

This picture shows a method of growing corn and cowpeas together. The lower leaves are stripped from the corn, dried and stacked for fodder. The peas are thus prevented from being excessively shaded.

planted in a furrow, usually 4 to 6 inches below the surface, and by the time cultivation is discontinued the earth about the stalks will have been raised several inches above the level of the field. The extravagant claims which were made for the method at the outset have not been substantiated by more recent tests. (See Bulletins 135 and 138, Alabama Agricultural Experiment Station, and Bulletin 93, Georgia Agricultural Experiment Station.)

The water-furrow method of corn culture is especially adapted to well-drained, sandy, upland soils in the South. It is practiced chiefly in the Gulf States. This method accomplishes essentially the same result as is secured by the use of the lister in the dry regions of the Southwest. When the corn is to be planted in this way, the land is backfurrowed so as to leave what is known as "water furrows" about 5 feet apart. Upon the completion of the backfurrowing, a strip of soil, 6 to 8 inches wide, is left undisturbed along the line where the water furrow is to be. Just before planting, this strip of soil is thrown to one side by the use of a double moldboard plow, known in certain sections of the country as a "middle burster." The corn is then planted in this fresh furrow by means of a corn planter equipped with a fertilizer attachment. The seed is thus left at a point from 5 to 8 inches below the level of the top of the ridge. During the

subsequent cultivation the soil is gradually worked toward the water furrow so that eventually the field is practically level.

The so-called "Allison method" of corn and cotton culture consists in alternating two rows of corn with two rows of cotton, with all the rows the same distance apart as is customary for cotton. The corn is planted more thickly in the drills than usual, with the idea of growing as many hundred stalks to the acre as the number of bushels of corn which the entire acre would produce if planted in the ordinary way. Wherever this is done, there is usually a serious loss in the cotton crop, and if the corn blows down, the cultivation of the cotton may be prevented. Thus the method has two serious drawbacks.

Another method of growing corn in Alabama and Mississippi is known as the "crossed-corn method." Rows of corn are planted at right angles to the cotton rows and 16 to 30 feet apart. Three to four corn plants are grown in each hill. Four to ten bushels of corn can be grown to the acre in this manner in addition to the cotton crop, yet the yield of cotton is greatly lessened. The results of experiments at the Georgia Agricultural Experiment Station do not show it to be a financial success. The corn may also interfere with the cultivation of the cotton in case it blows down.

INSECTS and DISEASES.—There are known to be more than 200 different kinds of insects injurious to corn and the corn plant. The CORN EARWORM, CORN LOUSE (aphis), the northern and southern CORN ROOTWORM, CUTWORM, WIREWORM, and the larvae of the MAY BEETLE are among the most serious of these pests. The injury caused by many of these insects is much greater if corn is grown in the same field for several successive seasons. The CORN BUD WORM which causes much damage in dry seasons may be destroyed by dusting into the unfolding leaves at the top of the stalk arsenate of lead mixed with flour, finely ground limestone, or other dusty material which is not injurious to the foliage. Sometimes a fine dry sand is used for this purpose. Most of the insect enemies can be practically controlled.

The WEEVIL is one of the worst pests attacking corn in Florida. If the corn cannot be fumigated, it is usually less liable to injury by weevils if the husks are left on. If, on the other hand, the conditions are such that it can be fumigated, the husks should be removed from the corn before it is stored, in order that the insects may be reached more readily by the fumes. The best method proposed for escaping, or lessening, the ravages of the weevil is to plant late-maturing varieties of hard or flint corn rather than varieties having soft kernels.

In addition to these pests, corn is sometimes injured by SMUT FUNGUS and EAR DISEASES. The best way of freeing the land of injurious insects and the germs of certain fungous diseases is to prac-

tice crop rotation. The injury caused by insects and diseases is generally less serious when corn is well fertilized and vigorous.

COVER CROPS FOR CORN.—In Florida it is often advantageous to plant leguminous cover crops in corn at the time of the last cultivation, for after the corn is cut they exclude weeds and reduce the loss of plant food by leaching. The chief aim, however, is to increase the quantity of nitrogen and humus in the soil.

Cowpeas and velvet beans are the two legumes usually planted as cover crops in corn, but cowpeas are preferred when the corn is to be followed by crops seeded in the autumn or when a large crop of corn is more important than an extra heavy cover crop. Velvet beans are best utilized for grazing after the occurrence of frost, and therefore they cannot be removed in time to seed another crop in the fall. The velvet beans climb the cornstalks, and if the beans are to be ripened completely the corn must often be left in the field until November or later, which may entail a loss of some corn by molding.

In some sections the cowpeas or velvet beans are drilled between the rows of corn at the time of the last cultivation by means of a one-horse grain drill in which some of the seed outlets are closed. When this is done the corn rows should be so far apart that 3 rows of cowpeas may be planted between each 2 rows of corn and still permit one shallow cultivation on both sides of the rows of cowpeas. It is considered better practice, however, to plant the cowpeas or velvet beans in the corn rows between the hills, for this method allows of more corn rows and earlier planting than the other.

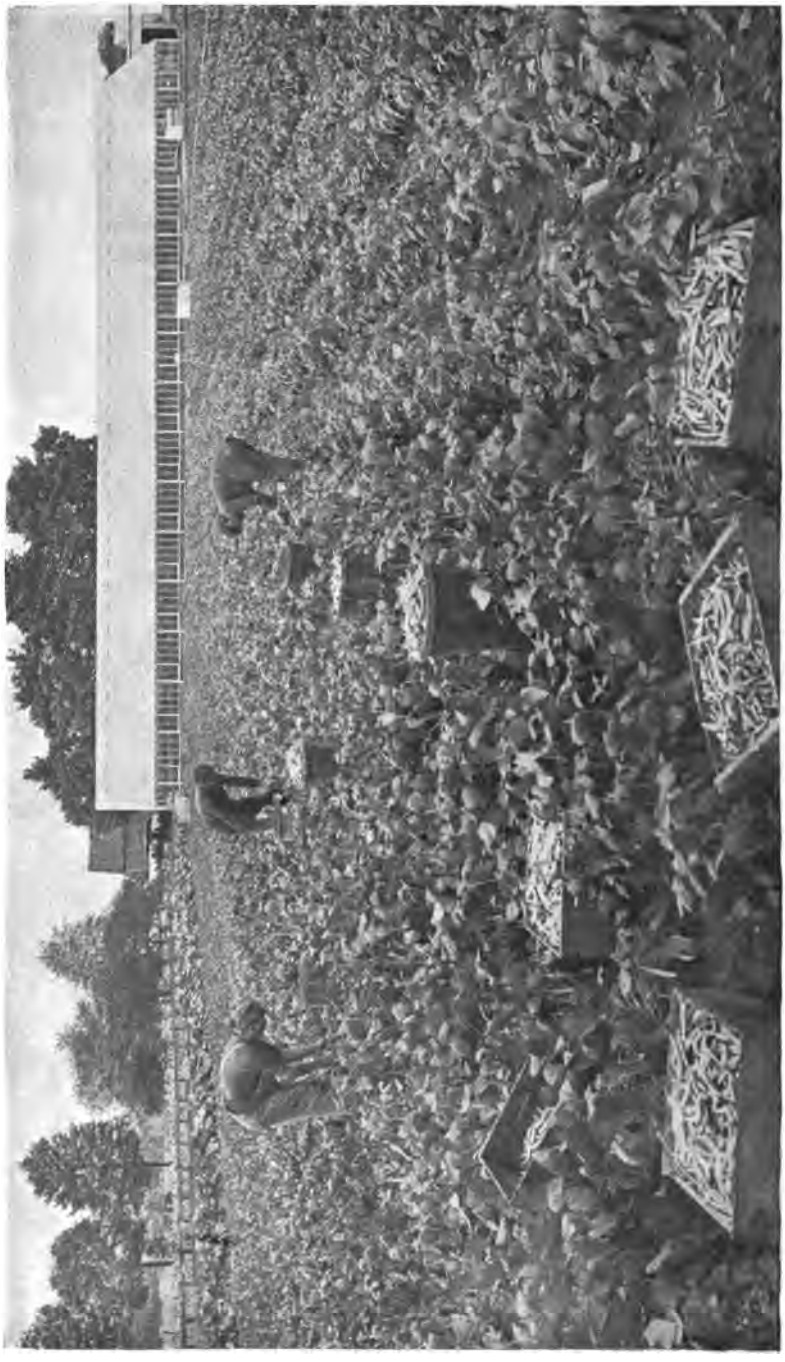
The legumes should receive fertilizer in addition to that used for the corn in order to hasten their maturity and ensure a larger yield of vegetable matter.

Send for our booklet entitled "How to Get a Crop of Corn," which is full of interesting and valuable information about corn growing.

COTTON

SOIL.—A well-drained, sandy or sandy loam soil, fairly well supplied with humus, is best for cotton, particularly if it is underlaid by a clay subsoil.

PREPARATION OF SOIL.—Land for cotton should be broken quite deeply in December or during the first two weeks in January. If there is considerable vegetable matter in the soil, plow 10 to 12 inches deep. If, however, the field has not been plowed for many years and contains only a small amount of vegetable matter, do not turn up more than 1 to 2 inches of subsoil the first season. Deep plowing early in the year lessens the "run off" or loss of water



Harvesting string beans at Danvers, Massachusetts. This field was fertilized with 800 pounds to the acre of our complete fertilizer. Stable manure was used in addition to the fertilizer.

from the surface of the ground and ensures a mellow, well-aerated seed bed in which the plants can make a vigorous, rapid growth.

Every cotton grower should practice a system of crop rotation in which crops, such as cowpeas, velvet beans, soy beans or vetches are grown and returned to the land. This may be done by plowing the crop under in a green or partially dried state or, preferably, by feeding it to cattle and utilizing the manure.

FERTILIZATION.—Few crops respond more readily to fertilizers than cotton; therefore enough fertilizer should be used to supply the plants with ample food at all times. Usually 600 to 1,000 pounds to the acre are needed. All of the fertilizer may be applied in the drills when planting, or half may be applied then and half scattered near the plants or between the rows in June.

SEED SELECTION.—Select for seed the plants which are most productive, on which the bolls open well and which bear seed well covered with lint of good length. Be sure to mark such plants by means of tape or strips of cloth, and at each picking, pick these plants first in order that the cotton may be ginned and stored separately. Plant the selected seed by hand so that it may go as far as possible. The second year, seed should be saved from the best plants in the field of selected cotton.

PLANTING.—It is advisable to plant as early in the season as conditions permit, or usually from March 15th to about April 10th. Plant, preferably by machine, in rows 5 feet apart so that the plants will be 6 to 20 inches apart in the row. Soon after the cotton comes up, replant all missing hills.

CULTIVATION.—In general, the cultivation should be frequent but shallow. Deep cultivation injures the root system of the plant and may cause premature ripening. It is advisable only when the cotton is growing so fast and so late that the development of the bolls needs to be hastened. Cultivate after each rain in order to conserve moisture, but never cultivate while the land is still wet.

COWPEAS

Cowpeas, or Southern field peas, may be used for green manuring, for forage or for human food.

COWPEAS AS HUMAN FOOD.—The use of cowpeas for table purposes is now common in many parts of the South. Like milk, eggs and meat, cowpeas are rich in protein. They are used on the table in the pod, shelled green, and shelled dry—corresponding respectively to string beans, shelled green beans, and dried beans. Dry

cowpeas are used more commonly and, like dry navy beans, they may be boiled or baked with fat meat and served in place of lean meat or of other foods rich in protein. When boiled and mashed through a colander, cowpeas make an excellent foundation for numerous dishes. They may be creamed with milk and butter like mashed potatoes; formed into croquettes with bread crumbs and fried or baked; made into a loaf with bread crumbs, minced vegetables, milk and seasonings; or made into soup. In palatability, digestibility and nutritive value, cowpeas compare favorably with beans, and because of their delicate and pleasing flavor they are often considered equal, if not superior, to them.

COWPEAS FOR HAY.—When properly cured, cowpea hay is equal to alfalfa. According to Professor McQuarrie, the proper time to cut cowpeas is when the first pods are in the snap stage, for later the stems become woody and the highly nutritious leaves drop off. Do not cut cowpeas when wet or the leaves will be discolored and the hay will not have the desirable bright pea-green color. The plants should be raked into windrows before night, for if left lying in the field until dry, the leaves will fall off. If the hay cannot be put under cover, it may be placed in a rick and protected by straw. The mere growing and marketing of cowpeas improves the soil but little in comparison with plowing them under or feeding them to stock and returning the manure to the land. Most of the cowpeas, as well as certain other legumes, are host plants for the fungus which causes tobacco root rot; hence they should not be used as green manures for tobacco.

VARIETIES.—For table use: SUGAR CROWDER—early; LADY—small white pea; BLACKEYE; WONDERFUL. For forage or green manure: IRON and BRABHAM—said to be resistant to nematodes.

GRASS AND FORAGE CROPS

In Florida there are millions of acres of poor natural grasslands that yield but little. If these lands were properly managed and planted to suitable grass and forage crops, they could be utilized profitably in producing cattle for the Atlantic Seaboard.

The partial substitution of animal husbandry, which involves the growing of forage crops, is proving in many cases far more profitable than the exclusive culture of purely speculative crops. In a well-planned crop rotation, forage crops fed to cattle and returned to the land as manure will supply organic matter and nitrogen more economically than the plowing under of cover crops. If, however, the soil is extremely poor and incapable of producing fair crops, it is

This picture shows how corn is planted with watermelons and other crops for the purpose of affording partial shade.

often desirable, if manure is not available, to build up the soil at the outset by plowing under leguminous crops.

Forage crops, such as sorghums, grain, cowpeas, Spanish peanuts and early-maturing soy beans, should be seeded in the autumn. Such crops, to quote from a recent article in a leading farm magazine, all have "three values, (1) a sale value, (2) a fertilizer value if plowed under, (3) a direct feeding and subsequent fertilizer value." When these crops are fed on the farm a much larger part of their plant food is lost than has been generally supposed; nevertheless, far more fertility is lost by the sale of a ton of cottonseed meal or hay than by the sale of the butter or milk which a cow makes from them. Assuming cottonseed meal to contain approximately $35.00 worth of plant food, the plant food in a ton of butter, reckoned on the same basis, is worth only about $1.00.

ALFALFA

The late Joseph E. Wing, the famous alfalfa specialist, said that lime is the key which opens the way to successful alfalfa culture. According to Mr. Wing, the essentials for the successful growing of this crop in the South are: (1) land not wet; (2) land well limed; (3) manure or fertilizer to make the land rich; (4) a good seed bed.

Without lime the alfalfa bacteria fail to thrive—the plants become sickly and failure results. August and September are the best months for sowing alfalfa in northern Florida, which is the southern limit for its successful growth. On suitable soils, such as our low hammock lands which are underlaid with marl, good stands are secured. In southern and central Florida on the higher, more sandy soils, alfalfa will not succeed even after liming, inoculating, and taking every precaution necessary to its success elsewhere.

JAPANESE CLOVER

Japanese Clover (*Lespedeza*) makes a splendid forage crop in many parts of the South. It has failed utterly in some sections of Florida and succeeded fairly well in others, no doubt due to varying soil conditions.

VETCH

Where vetch can be grown successfully it has a wider range of usefulness than most nitrogen-gathering plants: it fits well into various short rotations; it greatly enriches the land in a short time; it is relatively inexpensive to grow because the seed can be produced by the grower; it is reliable as to stand and hardiness if sown early and the autumn is not too dry; it is a splendid winter cover crop, but only where conditions are favorable to a strong autumn growth, since it grows little during the winter; it is a nutritious stock food which can be fed green, as hay, or as a component of silage; it prevents or lessens surface washing; it is adapted to soils ranging from sandy to clayey in texture; and its growth for seed is often profitable. Vetch serves as a good late winter and early spring pasture crop when sown by itself or with winter cereals, although in its green state it is not always relished by stock at first. It re-seeds itself to great advantage in certain systems of cropping.

SOIL.—Vetch thrives well in northern Florida on limestone soils, and on others to which a liberal amount of finely ground limestone has been applied. On slightly or moderately acid soils, vetch yields fair crops even without liming. Hairy vetch grows freely on sandy soils. It may be sown with winter grains, and it fits well, as a winter crop, into rotations on soils where other crops are likely to fail. The common (summer) and hairy (winter) varieties require a well-drained soil and are well adapted to medium loams.

FERTILIZER.—If the seed is inoculated properly or if the nitrogen-fixing bacteria for vetches are abundant in the soil, the fertilizer used should be low in ammonia. In any case it should be rich in available phosphoric acid, and fairly rich in potash.

Peppers following lettuce at Sanford, Florida, grown with our fertilizer applied in the drill at the rate of 1,000 pounds to the acre. The yield was at the rate of 700 crates to the acre.

SEEDING.—Seed of the hairy vetch may be sown in Florida from late in September to early in November. In all cases the seeding should take place early enough so that the plants may become well established before winter. It is often safer to sow winter oats or rye with hairy vetch than to sow the vetch alone.

To any interested person we shall be glad to send our booklet "Vetch and its Culture."

GERMAN MILLET

German millet yields well and is generally a sure crop. The best time for planting it in northern Florida is in May. In southern Florida millet can be planted much earlier. To secure the most nutritious and palatable hay, the millet should be cut when the seed is "in the milk."

GUINEA GRASS

Guinea grass is desirable for soiling or grazing in Florida. If planted on loose, well-drained soils it will grow well and afford feed from May until frost. It grows in clumps and is usually propagated by sets. Guinea grass withstands drought better than Para grass.

NATAL GRASS

Natal grass will grow continuously in the South for a number of years on the same land, although, as with other grasses, the yield gradually decreases. Old fields should be plowed before the crop can re-seed itself. They should then be devoted for one or two seasons to legumes or other suitable crops before re-seeding.

For more detailed information concerning this crop the reader is referred to our booklet on "Natal Grass," which covers the subject thoroughly and which will be sent free upon request.

PARA GRASS

Para grass grows rapidly and is nutritious. Eventually it promises to become to the Florida stockman what blue grass is to the Kentucky horseman and what alfalfa is to the Western farmer.

RHODES GRASS

Rhodes grass is a comparatively recent introduction from South Africa that promises to do well in Florida from Gainesville southward. Hammock land containing some clay is particularly suitable for this grass. It has a fine upright habit of growth and is easily mown. It will give a large amount of hay to the acre, comparable to timothy in quality.

SUDAN GRASS

Sudan grass has a stiff stem, and in favorable localities it gives heavy yields. It is similar to Johnson grass, excepting that it has no underground stems and consequently is not likely to become a pest. If it is not attacked by sorghum blight or red-spot, it will give a heavy yield of good hay. This disease may prove a serious drawback to its economic utilization in Florida.

OATS

Oats can be produced in Florida more cheaply than almost any other crop. Both the grain and hay afford splendid feed for draft animals, and both are usually harvested at a time when feed is badly needed.

Oats make an excellent winter cover crop either alone or grown with winter legumes. They are ideally adapted to various systems of crop rotation, and their extensive fibrous roots bring the soil into excellent condition.

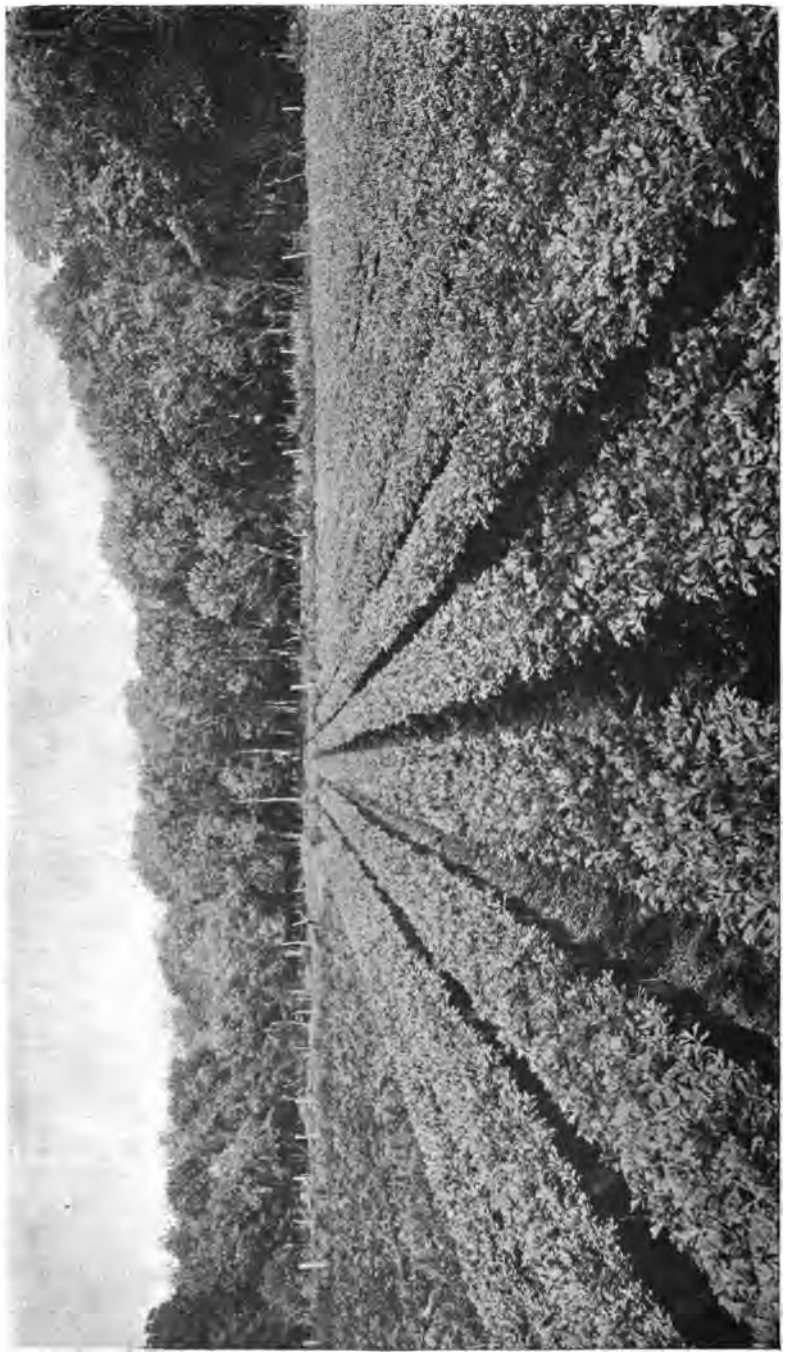
VARIETIES.—For Florida, TEXAS RED RUST-PROOF, APPLER, 100-BUSHEL and BURT are leading varieties. FULGHUM, a comparatively new variety closely related to the Red Rust-Proof but earlier and free from beards, is now grown extensively.

This picture shows a near view of a typical field of corn and velvet beans growing together.

SOIL.—Oats can be grown successfully on almost any well-drained Florida soil that is adapted to the culture of corn, cotton and other field crops. A loam moderately supplied with humus is especially suitable.

PREPARATION OF SOIL.—The seed bed should be compact below, but should be loose and mellow near the surface. This is accomplished by plowing the land to a depth of 5 to 6 inches at least a month before planting, and following immediately with a spike-tooth or other type of smoothing harrow. After double disking and another harrowing the field should be in good condition for seeding, although an additional disking and harrowing may be necessary if the land is hard and rough. If the oats follow corn or some other crop that has been well cultivated and the soil is reasonably well supplied with moisture, disking and harrowing may take the place of plowing.

FERTILIZATION.—By using good fertilizer many farmers get more than 50 bushels of oats to the acre on land which, without it, would not produce more than 10 to 15 bushels. The amount of fertilizer to apply and the grade to use will depend upon the character and condition of the soil. If the land has been enriched by the cultivation and turning under of legumes or by the use of considerable manure, the fertilizer need not contain much, if any, ammonia; it



A crop of celery grown with our fertilizer near Bradentown, Florida. In this case a special kind of paper is used on the sides for blanching, instead of boards or earth. The plants, excepting on the outside of the rows, are so thick that they blanch themselves.

should, nevertheless, be rich in phosphoric acid, and, at least for sandy soils, should preferably contain some potash. As a rule, from 400 to 500 pounds of fertilizer to the acre should be applied at the time of seeding, and this may be followed later, if necessary, by a top-dressing of 100 to 150 pounds of nitrate of soda. For winter oats this subsequent top-dressing should be applied in the spring, and for spring seedings it should be applied when the oats are well up. Special brands of fertilizer are available for each of these purposes.

PLANTING.—Winter oats generally yield better than spring oats. The fall seeding may be done in October, November or December, although preferably during November, and spring seeding in January or February. About 2 bushels of seed to the acre are generally used if sown with a grain drill or in open furrows, and 3 to 4 bushels if sown broadcast. In addition to requiring less seed, the stand and growth are better when the oats are sown with a grain drill than when they are broadcasted. Drag chains should not be used on the drill, nor should the land be harrowed after drilling, for the roughening of the surface by the drill lessens the blowing of the soil and ensures additional protection to the oats, particularly during the winter months. When sown broadcast, the oats should be harrowed in with a smoothing harrow or with a light disc harrow.

The open-furrow system of planting is now followed by many farmers. This involves sowing the oats in drills 16 to 24 inches apart in such a way that the crowns of the plants are 2 to 3 inches below the surface. The furrow is made with a shovel plow, the seed is sown by hand and is then covered, or it may be sown with the ordinary single-row planter. If a seed drill with a fertilizer attachment is at hand, it may be used to distribute the fertilizer in the furrows and sow the seed, in one operation.

INSECTS and DISEASES.—In many sections SMUT causes severe losses, which fortunately can be prevented by treating the seed oats before sowing with a mixture of 1 pound of formalin and 40 gallons of water. The grain should be spread on a clean floor or canvas and while being shoveled over, it should be sprinkled with the solution. One should be sure that all of the grain is moistened. It should then be covered with blankets or canvas and left for several hours or over night. It may then be sown at once or spread out to dry. If sown immediately, more than the usual amount of seed will be needed because of its swollen condition. If the seed is dried, it will run through the drill much better than if still moist. Effective means of avoiding or lessening RUST are: planting rust-proof varieties of oats, sowing on well-drained land, the use of fertilizers rich in phosphoric acid and potash, which induce early maturity. Many of the varieties of so-

called "rust-proof" oats are to a high though varying degree immune to rust. Oats are usually quite free from attacks by insect pests.

HARVESTING.—Oats for hay should be cut "in the milk" and for grain when the bottom kernels begin to turn yellow, or, more specifically, when most of the grain has just passed into the hard dough stage. If cut at this time the grain will mature in the shock without shriveling and will have a bright color. Oats should be cut with a self-binding machine, although a cradle or mowing machine may be used. If cut with a mower, the oats should be raked into windrows when reasonably dry, later piled in cocks, and finally, when fully dried, placed in stacks or in the barn.

PEANUTS

The importance of the peanut crop is increasing rapidly in Florida and throughout the South. Its value as human food, for feeding, for the manufacture of oil, and for improving the soil is too well known to need comment.

VARIETIES.—For human food: VIRGINIA BUNCH—pods large, adhere well to vines. VIRGINIA RUNNER—heavy creeping foliage; pods large, adhere to vines poorly. AFRICAN or NORTH CAROLINA—very rank grower, massive, dark green foliage; pods medium size, with 2 or 3 nuts, rich in oil and of excellent flavor. DIXIE GIANT—grown only on Gulf Coast, requires long season, pods very large. For stock food: SPANISH—vigorous grower, abundant heavy foliage. TENNESSEE RED—similar to Spanish, pods contain 2 to 4 nuts.

SOIL.—Although peanuts thrive on almost any type of soil, a light soil is preferable. A good, well-drained, sandy loam, containing a reasonable amount of humus and ample lime, is ideal. Dark soils are likely to stain the shells of the peanuts, thus lessening their market value.

FERTILIZATION.—The peanut responds readily to good commercial fertilizer. From 800 to 1,200 pounds of fertilizer to the acre should be applied, according to the condition of the soil. It may be scattered by hand in a narrow strip where the row is to be located, or a fertilizer distributor may be used for the purpose. In all cases the fertilizer should be well mixed with the soil at the time of planting or preferably earlier.

PLANTING.—The soil should be thoroughly plowed and harrowed. If the soil does not contain sufficient lime, a suitable amount of ground limestone should be harrowed into the soil thoroughly some time before planting. If ground limestone is not available, a much

Natal grass, Bradentown, Florida. A crop which is attracting wide interest and which is well adapted to many of the light soils of Florida.

smaller amount of air-slaked or hydrated lime may be used, although they are not as pleasant to apply nor as safe to use, especially on rather dry sandy loams. The Spanish, or bunch varieties, should be planted 10 to 12 inches apart in the row, with rows 3 feet apart, while the flat varieties should be planted at intervals of 16 to 18 inches, in rows 3 to 3½ feet apart.

CULTIVATION.—About three shallow plowings with sweeps, and two hoeings are sufficient. After hard rains the crust should be broken with a light harrow or weeder. From the time the flower-buds begin to form the weeds should be pulled by hand, as any injury to the vines at this time is highly detrimental.

INSECTS and DISEASES.—The peanut is one of the few Southern crops which is practically free from insect pests or diseases.

HARVESTING.—Peanuts which are grown for hay or for soiling purposes should be harvested as soon as the leaves in the center of the vines begin to fall. A heavy yield of hay is secured at this time but not many well developed nuts. For all other purposes peanuts should be harvested at the time when one can secure the greatest yield of mature nuts.

By using a peanut digger or a potato-digging machine one can

dig on clear land from 5 to 7 acres of peanuts a day, which makes such a machine a profitable investment if the acreage is large. Most growers, however, use an ordinary plow from which the moldboard has been removed.

After digging, the vines with the peanuts attached, are shaken free from soil and thrown together in bunches. From three to four hours later they should be gathered and placed on stakes or small posts for complete curing.

THRESHING.—With the latest improved machinery the peanuts may be thoroughly cleaned and stemmed, the vines cleaned, the roots shredded and the peanuts separated ready for market. The material remaining after the separation of the nuts possesses a high feeding value.

YIELD.—The average yield of Spanish peanuts is about 60 bushels of nuts and one ton of residue or "hay" to the acre. Peanuts mature in from 12 to 14 weeks, hence two crops can be grown in a single season. The yield of the low, spreading varieties is about 70 bushels of nuts and 1¼ tons of hay to the acre. By the use of fertilizers well adapted to the particular soil, yields much above the average may be expected.

PINEAPPLES

VARIETIES.—The RED SPANISH is the standard variety for open field culture in Florida. It is sometimes grown under sheds, but the sheds should preferably be utilized in growing varieties that produce larger fruit, such as the SMOOTH CAYENNE or ABAKKA.

SOIL.—Pineapples are exceptionally sensitive to unfavorable soil conditions. A loose, well-drained, sandy soil which contains but little carbonate of lime or manganese is essential. If water stands around the roots of pineapples, it is certain to cause disease, and probably failure of the crop, regardless of the character of the soil. The soil need not be rich in plant food, as pineapples will thrive well on poor sandy soils if they are fertilized sufficiently.

The spruce pineland on the Indian River is excellent for pineapples. Likewise land having a yellow subsoil and covered with pine and a fair sprinkling of hardwood is considered ideal. In the interior of the State ordinary high pineland is used with good results. On soil with a hardpan subsoil, it is necessary to bed the land in order to ensure prompt and adequate drainage during rainy weather.

FERTILIZATION.—Heavy fertilization is absolutely necessary for pineapples on nearly all soils devoted to this crop. Some growers make only one application of fertilizer yearly, during the

This picture shows the method of planting peanuts in Florida. This is a crop which is increasing rapidly in commercial importance.

summer or in November or December. Because of the great danger of winterkilling if pineapples are overfertilized with highly nitrogenous fertilizer in the late autumn, it is usually safer to divide the amount and make two to four applications. If three are made, the first should be after the fruit is harvested, the second during the fall, and the third in the late winter or spring just before the blossoming period. A good plan is to work 1,200 pounds of fertilizer to the acre into the soil before planting. This should then be followed with occasional applications at suitable seasons. Apply yearly thereafter from 2,000 to 3,000 pounds to the acre. When the plants are set, a heaping teaspoonful of a mixture composed of one part tobacco dust and four to five parts of cottonseed meal should be dropped into the heart of each plant. This acts as a plant food and insecticide, and prevents sand from getting into the bud.

PLANTING.—Suckers of the common varieties are planted for the main crop. In preparing these for planting some of the lower leaves and a part of the butt end are removed. They are then set 3 to 5 inches deep, but never so low that sand can be easily blown into the bud. Many growers trim off the ends of the leaves in order to prevent the wind from blowing the suckers over, but this practice should be avoided if possible. Plants may be set at any time of the

year, but the usual time is from July to November. They are generally set 21 by 21 inches apart in beds ranging usually from 2 to 8 plants wide. A passageway 2 rows wide is left between the beds. After harvesting the fruit a field may be renewed, without replanting, by leaving a sucker at the base of each old plant to take its place.

CULTIVATION.—About a month after the plants are set, loosen the surface soil with a hoe and destroy all weeds. Cultivate at regular intervals, but not too frequently. Usually three or four cultivations a year are sufficient. Avoid injuring the roots by deep cultivation and do not break the leaves.

INSECTS and DISEASES.—"WILT" or "BLIGHT," remove and burn affected plants; MEALY BUGS and RED SPIDERS, place a handful of tobacco dust directly in the heart of the plant.

HARVESTING.—Pineapples are harvested in May, June and July. The apple is seized with both hands and given a slight, twisting bend which causes it to snap off from the stem. It is then tossed to a man in the passageway between the beds. The fruit is graded, wrapped in heavy glazed paper, and packed in ventilated crates. The grading is usually done by the eye, although mechanical graders are now being introduced extensively in Porto Rico and elsewhere.

RICE

Rice is an important article of food throughout the world. It contains more digestible nutrients than wheat or any other grain. Rice has a food value nearly four times that of potatoes and nearly twice that of beef, partly because it contains less water.

In 1915 about 28,947,000 bushels of rice were grown in the United States, and in 1916 the production reached 40,702,000 bushels. Notwithstanding this tremendous increase, prices were firm with a slightly upward tendency, showing that the demand is keeping pace with or exceeding the supply. The crop has long been cultivated with profit on a small scale in Florida.

VARIETIES.—BLUE ROSE, JAPAN, and EARLY PROLIFIC are now replacing CAROLINA UPLAND and HONDURAS.

SOIL.—Rice succeeds best on clay loam soils, and it does better on other soils if they are underlaid by clay. Soils composed largely of peat or muck and those which are very sandy and dry are not adapted to rice culture. In Florida rice can be grown on many soils adapted to the growing of corn, cotton or sugar cane. Upland rice thrives on sandy loams, containing a reasonable amount of humus, if the other conditions are favorable. Alluvial river bottoms and other wet places, where the drainage can be controlled and irrigation sup-

plied, are especially suited to rice, including the upland varieties. In fact, many authorities hold that irrigation or flooding is essential to successful commercial rice culture. Good drainage is, nevertheless, as important a factor as abundant moisture.

FERTILIZATION.—Rice, like cotton, corn and grain, should be well fertilized. The amount of fertilizer to use depends upon the condition of the soil, but it should usually range from 400 to 1,000 pounds to the acre. It is very important in rice culture to have the fertilizer properly compounded, for the reason that certain ingredients which act splendidly in the production of most other crops should seldom or never be used for rice under certain conditions. We have something special to say about fertilizers for rice to any grower who is sufficiently interested to write to us.

PLANTING.—The soil should be thoroughly pulverized to about the same depth as for corn or oats, and then leveled with a smoothing harrow. Upland rice is often planted at the rate of 1 to 1½ pecks to the acre in drills or rows 30 to 36 inches apart. This ensures a thin stand. Lowland rice is usually sown at the rate of 1 to 3 bushels to the acre, and consequently the rows are much nearer together and the stand thicker. The use of a drill is recommended in planting in order to ensure a uniform stand, but some lowland rice is still being sown broadcast. After seeding, the field should be rolled lightly, since this prevents birds from pulling up the young plants in their search for seed. The planting may be done from March 15th to June 1st, but the best results are secured when the seed is sown prior to May 15th.

CULTIVATION.—The cultivation of upland rice should be shallow but regular, in order that the fields may be kept free from weeds and grasses.

RYE

Rye thrives well in Florida and it is a splendid food for man as well as for swine and other farm animals. It is admirably adapted to permanent systems of crop rotation, to use as a cover crop for soil improvement, and to grazing. It can be grown profitably on many poor soils.

VARIETIES.—ABRUZZI—a rapid, vigorous grower; suitable for grazing, soiling, grain, or cover crops. BEECH ISLAND and FLORIDA BLACK SEEDED—taller and earlier than Abruzzi, but yield less grain.

SOIL.—Rye can be grown on almost any well-drained Florida soil but it produces the best yield and quality of grain when planted

on loam soils that are well supplied with lime. Rye makes a good "first crop" on newly-drained marshlands and on cut-over lands that are just being brought under cultivation.

PREPARATION OF SOIL.—When rye follows a cultivated crop, such as corn, tobacco, or cowpeas, the soil can usually be prepared for seeding with a disc or ordinary harrow. The harrowing should be done, however, as soon as the preceding crop is harvested, in order to prevent the growth of grass and weeds. Just before the rye is sown it may be necessary to harrow again in the same manner, following with some type of smoothing harrow.

If rye follows cotton, the cotton stalks should be plowed under deeply enough to bury them. The land should then be firmed with a roller and the rye sown with a disc drill.

When rye follows crops which have received no cultivation, the seed bed should be prepared by plowing to a depth of 6 to 7 inches, preferably several weeks before seeding. The land should then be disc-harrowed immediately and worked down with other suitable harrows and a drag or roller, in order to kill the weeds and pack the soil below. The surface should then be broken occasionally with a weeder or smoothing harrow, in order to kill weeds and conserve moisture. In any case, when it is time to sow the grain, a fine, mellow seed bed should be prepared, by using a smoothing harrow or other suitable implement.

FERTILIZATION.—Although rye grows on poor soils, large yields of forage or grain are secured only from soils that are fairly fertile. If stable manure is obtainable, it may be applied at the rate of from 3 to 4 tons to the acre. From 250 to 400 pounds to the acre of a high-grade fertilizer should be applied when the seed is sown. This fertilizer should usually contain 2 to 3 per cent. of ammonia, 8 to 10 per cent. of available phosphoric acid and preferably some potash. After growth starts in the spring, a top-dressing of from 50 to 75 pounds to the acre of nitrate of soda may be applied. On naturally rich soils, or on those fertilized heavily for a previous crop, the fall and spring applications of fertilizer for rye may be reduced materially, or the spring application omitted.

PLANTING.—Rye may be sown in drills 6 to 8 inches apart, using a regular grain drill and covering the seed from ½ an inch to 2 inches deep, according to the moisture conditions, the season and the character of the soil. If a drill is not available, rye may be sown broadcast and covered by harrowing. The seed may also be sown broadcast in cotton, corn, or other standing crops without previous preparation of the soil, although it is better to harrow the land first. In any case the seed should be covered with a light narrow

weeder, a broadsweep, double-shovel cultivator, or other suitable implement which can be run once between the rows.

In Florida rye is usually sown in November, or very early in December. When grown as a grain crop in Florida from 3 to 4 pecks of seed are used to the acre, whereas in the North from 4 to 5 pecks are used. If intended for soiling, the seeding should be heavier. The rye should be freed of all weed seed before it is sown.

INSECTS and DISEASES.—ERGOT, guard against it by planting grain free from disease. Rye has no special insect enemies, although it is attacked more or less by such insects as CHINCH BUGS, GRASSHOPPERS, and ARMY WORMS. The HESSIAN FLY attacks rye less than wheat; avoid by sowing late. INSECTS IN STORED GRAIN, destroy by the use of liquid carbon disulphid.

THE LIQUID CARBON DISULPHID TREATMENT.—If the grain is to be treated for the destruction of WEEVILS, place it in air-tight bins holding from 30 to 40 bushels. Pour one pound of carbon disulphid in shallow vessels on top of the grain and cover the top of the bin as tightly as possible. The liquid readily vaporizes and the fumes, being heavier than air, pass down through the grain, destroying all insects.

CAUTION.—Do not smoke, or use any light where this is being done, for the mixture of air and carbon disulphid vapor is terribly explosive.

SORGHUM

The value of sorghum as a farm crop has been underestimated so generally that corn is frequently grown and used where sorghum should be substituted. Aside from its special use for syrup, sorghum is almost as valuable as corn for feeding. In Florida under conditions favorable to the growth of corn, sorghum will produce as much grain as corn and a greater amount of forage or silage. Its ability to withstand drought and other unfavorable conditions makes the crop extremely reliable for the production of feed.

VARIETIES.—The saccharine or sweet sorghums grown for forage, pasture, silage and soiling purposes, include the AMBER, ORANGE, SUMAC and the GOOSENECK group. The non-saccharine or grain sorghums, grown chiefly for their grain, include the KAFIR group, embracing WHITE MILO (Large African Millet), and the DHOURA group which includes JERUSALEM CORN and YELLOW MILO.

SOIL.—Sorghums grow well on almost any good tillable land.

FERTILIZATION.—On rich well-prepared land from 400 to 800 pounds of fertilizer to the acre should be used, but if the soil is poor a larger quantity will be required.

A field of young sugar cane grown with our fertilizer at Arcadia, Florida.

CULTIVATION.—Sorghum is cultivated the same as corn; hence a well-prepared, mellow seed bed, and good clean cultivation are necessary. The rows are made from 3½ to 4 feet apart, and the seed is drilled in.

SUGAR CANE

No state in the Union, not excepting Louisiana, Texas, or the beet-sugar states, has conditions superior to those of Florida for the profitable production of sugar. Excellent yields of sugar cane, of high sugar content, are produced successfully and economically in all parts of Florida, but the largest acreage is in the northern counties.

The reclaimed lands of the State are eminently fitted for the culture of sugar cane. These lands embrace the Everglades and fifteen or more drainage districts, each having an area of 30,000 to 350,000 acres. The reclaimed areas have wonderfully productive soil, abundant rainfall and long-continued sunshine—the three essential factors in the successful production of sugar cane. The Peninsular portion of the State is the equal of Cuba for sugar production, both as to soil and climate.

Florida growers should consider carefully the possibilities of profit from this crop.

VARIETIES.—BOURBON, RED and YELLOW RIBBON, and GREEN or SIMPSON are popular varieties. Light-colored varieties are preferred for making syrup as they produce a light-colored product. A light-colored variety planted extensively in Louisiana, known as D-74, is also well adapted to Florida.

SOIL.—Low hammock or swamp lands, if well drained, are especially suited to the growth of sugar cane. Cane also thrives and yields a fine grade of syrup when planted on good pineland.

FERTILIZATION.—On pineland, 800 to 1,000 pounds of fertilizer to the acre should be broadcasted about a week before planting. This may be followed by an application of 200 to 250 pounds of nitrate of soda to the acre in June or July, unless the fertilizer is especially rich in ammonia. On rich hammock land, 300 to 500 pounds of fertilizer to the acre should be used for the first application, followed by about the same amount well worked into the soil in June or July.

SEED CANE.—The cost of planting is considerable for the reason that about 4 tons of cane are required to plant an acre.

PLANTING.—The plowing should be deep and the harrowing thorough. Where climatic conditions permit, plant from October 15th to November 15th, but otherwise in March. The cane for planting should be cut in from 2- to 4-foot lengths and planted in furrows 5 to 6 feet apart, so that the pieces will overlap a few inches, and the top piece even more. Cover about 3 inches deep and after the plants are well up, fill the furrow.

CULTIVATION.—Cultivation should be shallow and at frequent intervals, commencing soon after planting. A light harrow will answer for the first cultivation, but after the plants are up a cultivator should be used.

HARVESTING.—Cane is mature when it has shed its blades. For making sugar only the mature cane is suitable, but for syrup immature cane is better. Many growers strip the cane late in October in order to hasten ripening. It is then allowed to stand until late in November, and the tops are removed just before cutting. In cutting cane for syrup a few immature joints should be left at the top of the cane, since the juice from these joints tends to prevent the syrup from "sugaring."

SWEET POTATOES

A good crop of sweet potatoes, yielding a large amount of nutritious food, can be grown with little expense in Florida; therefore

TOMATOES INTERPLANTED WITH CORN

Tomatoes interplanted with corn following a crop of celery grown with our fertilizer at Manatee, Florida. Two tons of fertilizer to the acre were used for the celery in three applications in the row, and the residue left behind in the soil produced the tomatoes and corn. The yield of celery amounted to 600 crates to the acre, the estimated yield of tomatoes was 200 crates and of corn twenty-five bushels to the acre. The corn was grown chiefly to shade the tomatoes and a succeeding crop.

their cultivation should be encouraged particularly at this time. Set your idle acres at work by planting sweet potatoes! Recently a prominent authority on foods said:

"There is no crop grown in America that yields more food for the work required than the sweet potato. It is more nearly a balanced ration than anything else grown in America. One can live longer on sweet potatoes than on any other article of food that grows in our country. It has more food value than the Irish potato which is so extensively used. The native Indians of warm climates almost lived on the yam. Southern negroes often make it their principal diet. General Francis Marion and his soldiers of Revolutionary fame lived for weeks on sweet potatoes roasted in camp fires at night. They also furnished feed for their horses when the supply of corn had been exhausted."

VARIETIES.—PROVIDENCE and NANCY HALL—popular light-colored sweet potatoes. BLACK SPANISH, WEST INDIAN and the "PORTO RICO"—of the yam type, are grown extensively.

SOIL.—The sweet potato does well on almost all well-drained soils, although it thrives best on those which are warm, dry, friable and neutral or slightly alkaline. Very little organic matter is necessary, for some of the best crops are grown on nearly pure sand underlaid by a clay subsoil.

PREPARATION OF SOIL.—The soil should be prepared practically the same as for corn. Plow and harrow thoroughly, in order to put the field in mellow condition. Throw up beds with an ordinary plow or disc bedder and "drag" the top of the bed, in order to properly level it for planting.

FERTILIZATION.—If the conditions are right, liberal applications of suitable fertilizer ensure heavy yields. Use 1,000 to 2,000 pounds of fertilizer to the acre, applying half of it to the beds a week or ten days before planting and half just before the vines become too large to permit working in the fertilizer. If the field is cultivated level, the fertilizer may be broadcasted and harrowed in.

SEED.—There are two methods of growing the plants for field setting. (1) Selected potatoes are planted in ridges during the early spring, and the vines are cut for planting when they are 2 to 3 feet long. Such vines usually produce large tubers. (2) The potatoes are planted in beds and covered with a shallow layer of earth. When the sprouts are 5 to 6 inches long, "draw" or remove them carefully and transplant, taking care to water the beds thoroughly before drawing. More plants are secured from a given number of seed potatoes by this method than by the preceding one, and as a rule the potatoes mature somewhat earlier. One barrel of seed will produce from 7,000 to 11,000 plants.

SETTING PLANTS.—If level culture is practiced, the plants should be 2 to 2½ feet apart each way. If the potatoes are to be grown in beds, the latter should be about 10 inches high and 2 feet across with 3- to 4-foot spaces between them. In setting, mark the position of the plants 18 inches apart in the bed and drop the "draws" or cuttings at these points. The cuttings are set by forcing the middle of the vine into the earth by means of a forked stick, and pressing the earth firmly about them. Water well, unless the planting is done before a rain or during a shower. The hand method of planting is used most commonly, although there are several potato-planting machines on the market which set the plants and water them at the same time.

CULTIVATION.—Cultivate frequently in order to keep the soil loose and prevent the growth of weeds. The use of a two-horse cultivator is desirable and if equipped with a fertilizer-distributor suc-

cessive applications of fertilizer can be readily made. If necessary turn the vines so that both sides of the row can be cultivated and fertilized. When the vines cover the ground thoroughly, further cultivation will be unnecessary.

INSECTS and DISEASES.—The sweet potato is remarkably free from insect enemies and from disease. In case FOLIAGE-EATING INSECTS attack the plants, spray with Pyrox or with arsenate of lead. If the vines are injured by FROST, cut off the vines or dig the potatoes immediately, in order to prevent the tubers from rotting.

DIGGING and PACKING.—Dig the potatoes when they are mature, for although a light frost will not injure them at that stage, a severe freeze will. If a potato digger is available it can be used to advantage; but if not, the potatoes may be dug by first throwing a furrow away from the plants with a disc cutter or a one-horse plow, and then following with a two-horse plow set to run beneath the plants so as to throw out and turn over both tubers and vines. After being sweated and dried, the potatoes are ready for storage. Place them in pits, hills or houses where they can be kept warm and dry. The tubers are shipped in sacks or barrels, according to market conditions.

SECTION THREE
CROPS FOR THE HOME GARDEN

A few additional crops which can be grown successfully in Florida in the home garden, chiefly during the late spring and early summer, are described below.

Practically all of the vegetables discussed in the preceding pages can also be grown in the home garden at some time from early spring to summer, but beets, carrots, eggplant, onions, peppers and tomatoes are especially desirable. In summer some varieties of muskmelons will do well, while dwarf and early peas, romaine and other varieties of lettuce which do not head, can be grown under half shade. Lima beans, red kidney beans and cowpeas are also worthy of consideration.

We have many little booklets devoted to special crops which can be had free upon request. Ask for our "How-to-Get-a-Crop" booklets relating to the crops in which you are interested.

ASPARAGUS

Asparagus is planted chiefly in home gardens, although in central and northern Florida it is sometimes grown for market purposes.

Since an asparagus bed is expected to last for several years, the

soil should be prepared in a thorough manner. A well-limed, warm, sandy soil, that has been heavily manured, and has been devoted for some years to garden crops, is far better than a fresh soil, regardless of the amount of manure applied just before setting the plants.

Asparagus should be manured or fertilized in the spring just before the shoots appear, as the plants are then in condition to make immediate use of the plant food. If the application is made either quite early or very late in the season, some of the ammonia may be lost by leaching. A second application of manure or fertilizer should be made immediately after cutting has ceased. Unrotted stable manure does not produce the best quality of asparagus, and if used it should be applied at least several weeks before the shoots appear. Asparagus should never lack manure or fertilizer at any period of its growth, for large and abundant shoots can be grown only in very rich soil. It requires a large amount of ammonia, a fair amount of available phosphoric acid and a medium to large amount of potash.

In setting a new asparagus bed one-year-old plants are superior to older ones.

In order to grow "white" asparagus, the plants should be set in the bottoms of furrows that are at least 8 inches deep. These furrows should be opened 4 feet apart by using a turning plow twice in each furrow, and then cleaning out with shovels to the required depth. If, however, green shoots are desired, the crowns of the roots should be set not more than 3 or 4 inches below the surface.

Asparagus plants should be set about a foot apart in the row and the roots should be spread out in a natural position. Do not cover the crown of the root more than 2 inches at first, for the first shoots are not strong enough to force their way through a deep mass of earth. As they advance in growth, one may gradually fill in the furrows. Thorough, clean culture is essential at all times.

When the plants bloom, remove the relatively few female or seed-bearing plants, for they are less productive than the males and if left in the bed they will ultimately fill the soil with young plants which interfere with the growth of the others.

The shoots should be cut off close to the crown, but the greatest care should be taken not to injure either the crown or other shoots which are starting from it.

LIMA BEANS

Although lima beans are grown chiefly in the home garden, they have been planted extensively as a money crop in some parts of Florida. It has been demonstrated at Sanford and other points that, following either celery or lettuce in the late spring, lima beans are profitable

and valuable for improving the soil if the straw is turned under. Since it does not pay to fertilize beans heavily, they are often planted with little or no fertilizer following another crop that has been liberally fertilized, such as celery, lettuce, cabbage, or Irish potatoes.

Plant only the bush varieties, such as Henderson's Bush Lima, and follow the directions given elsewhere in this booklet for string or snap beans (page 26).

RED KIDNEY BEANS

The red kidney bean has been grown in the past to a limited extent, but the prevailing high prices for these beans should encourage their extensive culture in Florida for, like the lima bean, they can be grown as a secondary money crop following an early fall crop which has been well fertilized.

There are both pole and bush varieties of large kidney beans, but the pole varieties produce the heavier crops.

One should follow the directions for planting and cultivating as given for string and snap beans (page 26).

OKRA

In the home garden okra is grown as a summer crop, but for market purposes it should be planted in the late summer so that it will mature in the early fall. Okra is grown extensively in Florida for the Southern markets, where it is much more in demand than in the North. The low-bush varieties are the best for home use or shipping, although the tall ones, if planted in the early summer, do well and bear until frost comes. In the extreme southern part of the State okra for the home garden can be planted every month in the year. It is usually given shallow cultivation.

Acid phosphate and well-rotted stable manure are excellent for okra, provided they are worked into the soil before planting. Later one should make small applications of a fertilizer suitable for beans.

Okra is subject to attack by the green aphis, which can be destroyed by spraying both sides of the leaves with whale-oil soap, Black Leaf 40, or other tobacco extract, or by applying tobacco dust.

If okra is not picked when small and tender, it becomes hard and unfit for the market. In fact, nothing will kill its sale quicker than the shipment of woody pods. There is little doubt but that this desirable crop would become more popular in the market if only tender pods were shipped.

PUMPKINS

Pumpkins require so little care that they can be planted beside

or even in the hills of corn. For home use they are commonly planted along the fences at the edges of cultivated fields, where they require no attention. When planted in old fields, pumpkins require little or no fertilizer.

The "Indian pumpkin," which is really a cross between a squash and pumpkin, is one of the best varieties for home and market purposes. It is especially desirable for pies and puddings or for cooking and serving the same as squash. It has a small seed cavity and hard rind and will keep for several months after it is picked. The vines root at intervals and if they are left to themselves will spread over a considerable area. As a rule, the Indian pumpkin "volunteers" from season to season, and frequently when once planted on a farm it will continue for years to supply the family with all the pumpkins they require.

RADISHES

Radishes grow best on a rich, mellow soil. They are particularly appropriate for the home garden as they may be grown in Florida practically throughout the year. The small varieties may be sown in narrow rows, or broadcast among other crops, such as peas and beans. If a continuous supply is desired, successive seedings should be made at intervals of about ten days.

The fertilizer for radishes should contain a high percentage of ammonia, phosphoric acid and potash and should be applied at the rate of 2,000 to 3,000 pounds to the acre in order to ensure rapid growth which is essential to good quality. On sandy soils subject to leaching repeated applications of fertilizer may be made between the rows when the plants are dry, and care should be taken to have none of it fall on the leaves. The fertilizer should then be worked into the soil to a depth of 1 to 2 inches.

SWEET CORN

Sweet corn is one of the favorite vegetables for the home garden, and fortunately a continuous supply can be had for a long time by making successive plantings. The profits to be made from the sale of green corn locally are not sufficiently recognized, for it has a ready market at good prices and can be grown cheaply. Sweet corn, if properly irrigated, always does well in Florida provided the weather is dry.

For home gardens and for marketing there are several good varieties of sweet corn, such as Adams Extra Early, Ferry's Early Sugar Corn and Snowflake. These are fit for eating about six weeks after planting.

This picture shows the method of planting tomatoes without staking, in southeastern Florida.

A soil which is warm, well-drained, deeply plowed, and thoroughly cultivated is best for corn.

Sweet corn requires more fertilizer than ordinary field corn, and the fertilizer should be richer in ammonia. A fertilizer for sweet corn should contain a liberal amount of ammonia, available phosphoric acid, and also of potash, when the latter is obtainable at reasonable prices.

Sweet corn is usually planted after all danger from frost is over, and successive plantings should be made at intervals of two weeks.

TURNIPS

In Florida the main crop of turnips for winter use is planted late in the summer or in the fall, although they may be planted almost any month in the year, depending upon when the crop is desired. When sown in the spring, the seed germinates promptly, the growth is rapid, the turnips are ready for use early and they are sweeter, more juicy and much more tender than when grown as a winter crop.

Turnips grow best on new ground or on soil which has not been cultivated for several years. If stable manure is used, it should be applied several months before the turnips are planted; otherwise the

Packing tomatoes grown with our fertilizer at Larkin, Florida.

crop is likely to be spotted, rank, and generally inferior. In order to secure turnips of excellent quality, a reasonable amount of one of our vegetable fertilizers should be used.

Sow the seed thinly in drills and cover lightly. This work should be done preferably with a seed drill. Cultivate regularly, for this will conserve moisture by keeping down weeds and lessening surface evaporation.

PART THREE

INOCULATING LEGUMES

In order that legumes may fix and assimilate atmospheric nitrogen by means of the bacteria which inhabit and cause the development of root nodules, the seed or the soil must be properly inoculated. Such inoculation has often proved profitable in the case of cowpeas, velvet beans, soy beans, peanuts, vetch, clovers and other legumes, although many of these crops can be grown on certain soils without inoculation if the right strains of bacteria are already present in them. Pure cultures for inoculating the seed at planting time can be purchased at nominal cost. Such cultures contain millions of nitrogen-gathering bacteria. In purchasing these commercial cultures one should always specify the acreage and the particular crop for which they are intended. The directions for the use of these cultures accompany the packages.

It is becoming common practice to inoculate legumes by using soil taken to a depth of 8 to 10 inches, from fields in which the same or other legumes requiring similar strains of bacteria have grown and developed abundant nodules on their roots. This method is usually effective, but it is likely to be expensive because of the amount of labor required to secure and spread the 500 to 2,000 pounds or more of soil that should be used to the acre. The soil used for inoculating must be protected from the sunlight by spreading it on a dull day when possible, and in all cases the harrow should follow immediately after the spreader. The larger amount of soil used, the more complete and effective the inoculation is likely to be. One should not use soil containing seeds of bad weeds.

In examining roots of plants to see whether they have nodules one should not mistake the nodules or excrescences filled with minute worms (nematodes) for the true bacterial nodules concerned in the fixation of atmospheric nitrogen.

The following table, partly from the work of A. L. Whiting, shows which legumes can be inoculated by a given culture or soil. Any legume in any one of these groups, if it has bacterial nodules on its roots, will inoculate any other legume in the same group.

Group 1	*Group* 2	*Group* 3
Alfalfa	Soy beans	Velvet beans
Bur clover		
Sweet clover		

Group 4	*Group* 5	*Group* 6
Red clover	Vetches	Cowpeas and
Crimson clover	Canadian field peas	"Partridge" pea
White clover	Garden peas	
Alsike clover	Lentils	

Group 7	*Group* 8	*Group* 9
Ordinary beans	Lespedeza	Beggarweed

Recent experiments of the United States Department of Agriculture (Farmers' Bulletin No. 962) show that lima beans, cowpeas, lespedeza and velvet beans may all be inoculated by the same strain of bacteria.

FUNGICIDE FORMULAS

AMMONIACAL COPPER CARBONATE

Copper carbonate	5 oz.
Ammonia	3 pt.
Water	50 gal.

Dissolve the carbonate of copper in ammonia water and keep it in glass-stoppered bottles. Dilute to the required strength. The solution loses strength on standing. This should be used late in the season where bordeaux mixture would spot the fruit.

BORDEAUX MIXTURE

Copper sulphate (blue vitriol)	4 lbs.
Lime (unslaked or quicklime)	4 lbs.
Water—enough to make	50 gal.

Place the copper sulphate in a bag and suspend it just below the top of the liquid in a barrel containing 25 gallons of water. By morning it will all be dissolved. Put the lumps of quicklime in a tub and at first merely moisten them with hot water, and add more warm water gradually until the slaking of the lime has warmed the entire mass; then add slowly more warm or cold water, stirring constantly until a good, thin whitewash is produced. If too much water is added at first, it will "drown" the lime, and if water is added too slowly the lime will "burn." After the lime is thoroughly slaked, add enough water to make up 25 gallons.

The best way to mix these two stock solutions is to draw them together into a third tank, barrel, or other container, running a stream of the copper sulphate and a stream of the lime solution through

strainers into this third container, with constant stirring of the mixture. Bordeaux mixture should always be mixed the day it is to be used.

CORROSIVE SUBLIMATE

Corrosive sublimate ..... 2 to 2¼ oz.
Water ..... 15 gal.

Dissolve the corrosive sublimate in 2 gallons of hot water and then dilute to 15 gallons. Use only wooden vessels. The seed potatoes which are to be treated may be left in the sack if preferred. They should be immersed in the solution for exactly 1½ hours and then dried, cut and planted.

CAUTION.—Corrosive sublimate is very poisonous and care should be taken not to get any of it into the mouth and not to leave it where it can get into wells or springs or where farm animals can drink it.

FORMALIN

Formalin (40 % formaldehyde) .... 1 pt.
Water ..... 30 gal.

This is also used for treating seed potatoes; it has the advantage of being much safer than corrosive sublimate if any of it is left standing about the premises. After immersing the potatoes in the solution for 2 hours, dry, cut and plant as usual.

As a soil drench, for tobacco or other seed beds, use 2 pounds or more of formalin to 50 gallons of water.

PYROX

Pyrox is a combined fungicide and insecticide which kills leaf-eating insects like potato bugs, apple worms and cabbage worms, and prevents attacks of fungous diseases like potato blight, tomato blight and apple scab. It serves the same purpose as a mixture of arsenate of lead and bordeaux mixture, and adheres to the foliage much better.

Pyrox is prepared for use by simply mixing it with the proper amount of water. It will not clog the finest nozzles, and when once dry on the foliage even heavy rains fail to wash it off appreciably.

As a spray for general use against leaf-eating insects and fungous diseases, Pyrox has given satisfactory results for more than twenty years. We shall be glad to send you free, upon request, a book which tells about Pyrox and how to use it.

For potatoes and tomatoes Pyrox is used in the proportion of 1 pound to 5 or 6 gallons of water.

INSECTICIDE FORMULAS

ARSENATE OF LEAD (a stomach poison)

Arsenate of lead, 1 lb. dry or 2 lbs. paste
Water ..... 30 gal.

This may be applied stronger than some arsenical poisons and it adheres well to the foliage. It may be used with bordeaux mixture.

PARIS GREEN (a stomach poison)

Paris green ..... 1 lb.
Water .....75 to 150 gal.

If a spraying outfit is available for applying and keeping the water and Paris green stirred, it may be applied as a liquid spray. When Paris green is used dry, mix 1 pound of it with 50 to 75 pounds of flour, stir thoroughly and apply when dew is on the foliage. It may be used with bordeaux mixture. Arsenate of lead has now practically replaced Paris green as an insecticide.

CARBOLIC ACID EMULSION (a contact poison)

Hard soap, shaved fine ..... 1 lb.
Water ..... 1 gal.
Crude carbolic acid ..... 1 pt.

Dissolve the soap in boiling water; add the acid and churn as for kerosene emulsion. Dilute with 30 parts of water before using.

KEROSENE EMULSION (a contact poison)

Hard soap, shaved fine ..... ½ lb.
Water ..... 1 gal.
Kerosene ..... 2 gal.

Dissolve the soap in hot water, add kerosene, churn with a pump 5 to 10 minutes and dilute 4 to 10 times before applying. It should be used strong for scale insects. For plant lice, mealy bugs, red spider, and thrips, a weaker solution will be effective.

TOBACCO DECOCTION (a contact poison)

Boil 1 pound of tobacco stems or dust in 1 gallon of water for an hour, or until the liquid is the color of strong coffee. Strain to remove dirt, and add enough water to make 2 gallons for every pound of tobacco used. This is excellent for destroying plant lice and it does not injure the most tender plants.

In place of tobacco decoction, kerosene emulsion, whale-oil soap, or carbolic acid emulsion, for killing plant lice, red spiders and similar

A tomato catsup factory at Delray, Florida.

sucking insects one can use to good advantage one of the ready-made tobacco extracts such as Black Leaf 40.

WHALE-OIL SOAP (a contact poison)

Potash whale-oil soap..... 1 lb.
Water ..... 10 gal.

Some good authorities recommend using 5 to 7 gallons of water to 1 pound of soap.

NUMBER OF PLANTS TO THE ACRE AT GIVEN DISTANCES

12	inches	by	3	inches	174,240	plants
12	inches	by	12	inches	43,560	plants
18	inches	by	3	inches	116,160	plants
18	inches	by	12	inches	29,040	plants
18	inches	by	18	inches	19,360	plants
24	inches	by	18	inches	14,520	plants
24	inches	by	24	inches	10,890	plants
30	inches	by	12	inches	17,424	plants
30	inches	by	20	inches	10,454	plants
30	inches	by	24	inches	8,712	plants
30	inches	by	30	inches	6,970	plants

36 inches by 3 inches	58,080 plants
36 inches by 12 inches	14,520 plants
36 inches by 18 inches	9,680 plants
36 inches by 24 inches	7,260 plants
36 inches by 36 inches	4,840 plants
48 inches by 24 inches	5,445 plants
48 inches by 30 inches	4,356 plants
48 inches by 36 inches	3,630 plants
48 inches by 48 inches	2,723 plants
60 inches by 36 inches	2,901 plants
60 inches by 48 inches	2,178 plants

LEGAL WEIGHTS FOR FLORIDA

	Pounds per bushel
Apples, green	48
dried	24
Barley	48
Beans, shelled	60
velvet (in hulls)	78
Beggarweed seed	62
Castor beans, shelled	48
Corn on cob (with shuck)	70
Corn, shelled	56
Cotton, seed	32
sea-island	44
Chufas	54
Guavas	54
Millet	50
Oats	32
Onions	56
Peaches, dried	24
green	54
Peanuts	22
Pears	55
Plums	40
Potatoes, Irish	60
sweet	56
Quinces	48
Rye	56
Salt	60
Sorghum seed	56
Turnips	54
Wheat	60

SEEDING AND PLANTING DATA (Partly from Rolfs)

CROP	Time for Seeding or Transplanting		Amount of Seed Required to Plant		Days Required for Seed to "Come Up"	Time Required for Crop to Mature Reckoned from Time of Seeding
	In Northern and Central Florida	In Southern Florida	An Acre	100 Feet of Drill		
Alfalfa	Mch, Apr, Sept, Oct		20-25 lbs. broadcast 15-20 lbs. drilled			
Asparagus	Jan, Feb	Jan, Feb	4 or 5 lbs.	1 oz.	20-28	3-4 yrs.
Beans, bush	Mch, May, Aug	Jan, Mch-May, Aug	1½ bu.	1 pt.	4-8	45-75 days, dwarf 65-90 days, pole
Beans, butter or lima	May, June	May, June	5-6 pks.	1 qt.	4-8	65-100 days
Beets	Feb-Mch, Aug-Nov	Jan-Mch, Sept-Nov	4-6 lbs.	2 oz.	7-10	60-75 days
Brussels sprouts	Jan-Mch, Sept-Nov	Jan-Mch, Sept-Nov	2 lbs.	¼ oz.	6-10	100-120 days
Cabbage seed	Sept-Feb	Sept-Feb	½-1 lb.	¼ oz.	6-10	100-180 days
Cabbage plants	Oct-Feb	Oct-Feb	5000 plants			
Cantaloupes	Feb-May, July, Aug	Feb- Mch, July, Aug	2 lbs.	½ oz.	6-10	90-120 days
Carrots	Feb, Aug-Nov	Feb-Mch, Aug-Nov	4 lbs.	1 oz.	10-15	65-120 days
Cassava	Mch	Dec, Jan	3000 cut'gs	25 cut'gs		6 mos-2 yrs
Castor beans	Mch-April	Feb- Mch	1½ qts.			60-70 days
Cauliflower seed	Sept-Oct, Dec-Jan	Sept-Feb	1 oz.	¼ oz.	6-10	100-135 days
Cauliflower plants	Sept, Oct, Mch	Nov-Mch	7000 plants			
Celery seed	Aug, Sept	Aug, Sept	2 lbs.	¼ oz.	12-20	125-150 days
Celery plants	Nov, Dec	Nov, Dec	60,000 or 100,000 pl'ts			
Collards	Jan-May, Aug-Dec	Jan, Apr, Aug-Dec	4 oz.	¼ oz.		125-160 days
Corn, field	Mch-May	Feb-May	6 qt.-1 bu.			
Corn, sugar	Mch-May	Mch-May	8 qts.	1 pt.	8-10	60-100 days
Corn, sweet	Feb-Mch	Feb-Mch	8 qts.	¼ pt.		70-95 days
Cotton	Mch-Apr	Mch-Apr	1-3 bu.			
Cowpeas	Mch-Sept	Mch-Sept	1-1½ bu.			
Cucumber	Feb-May, Aug-Sept	Feb-Apr, Aug-Sept	1½ lbs	½ oz.	6-8	60-85 days
Eggplant seed	Dec-Feb, July-Aug	Sept-Feb, June	4-6 oz.	⅓ oz.	10-14	125-160 days

SEEDING AND PLANTING DATA— Continued

CROP	Time for Seeding or Transplanting		Amount of Seed Required to Plant		Days Required for Seed to "Come Up"	Time Required for Crop to Mature Reckoned from Time of Seeding
	In Northern and Central Florida	In Southern Florida	An Acre	100 Feet of Drill		
Eggplant plants	Mch-Oct	Nov-Apr, Aug	5000 plants			
Guinea grass			4000 sets			
Japanese cane	Mch	Mch, Nov	3000 canes			
Japanese clover (lespedeza)	Mch, Apr	Mch, Apr	25-50 lbs. unhulled			
Kale	Feb-Mch, Aug-Nov	Jan, Feb, Aug-Nov	2-4 lbs.	¼ oz.	6-10	85-120 days
Kohlrabi	Mch-Apr, Aug	Jan, Apr, Aug	4-5 lbs.	¼ oz.	6-8	65-85 days
Leeks	Jan-Mch, Sept-Oct, Dec			½ oz.	6-10	120-160 days
Lettuce	Jan-Feb, Apr, Oct-Dec	Jan-Mch, Aug-Dec	3 lbs.	¼ oz.	6-10	75-100 days
Millet	Mch-Aug	Mch-Aug	1 pk.			
Mustard	Jan, Sept-Dec	Jan, Mch, Aug-Dec	½ bu. br'd-cast	¼ oz.		45 days
Oats	Oct-Feb		2 bu. drilled 3-4 bu. br'd-cast			
Okra	Mch-May, Aug	Feb-May	10 lbs.	2 oz.		90-125 days
Onion seed	Feb-Mch, Aug-Dec	Jan-Mch, Aug	4 lbs.	1 oz.	6-10	120-150 days
Onion sets	Jan, Apr, Sept, Nov	Apr, Sept-Dec	8 bu.	1 qt.		
Para grass		Jan-Dec	250-450 sets			
Parsley	Aug-Sept	Aug-Sept	7 lbs.	¼ oz.	18-24	85-110 days
Parsnips	Feb-Apr, Sept-Nov		4-8 lbs.	½ oz.	12-18	100-150 days
Peanuts	May-June	Mch-July	½ bu. in pod			
Peas, English	Feb-Apr, Sept	Aug-Sept	1½ bu.	1 qt.	5-10	50-75 days
Pepper	Feb-Aug	Sept-Jan*	4 ozs.	⅛ oz.	10-14	95-130 days
Pineapples		July-Nov	14,000 slips			12-24 mos
Potato, Irish	Feb-Apr, Aug-Sept	Jan-Mch, Aug-Sept	10 bu.	5 lbs.	15-25	95-140 days
Pumpkin	Mch-May, July-Aug	Mch-May, July-Aug	4 lbs.	½ oz.	6-10	100-125 days
Radish	Jan, Mch-Apr, Aug-Dec	Jan, Mch, Apr, Aug-Dec	8 lbs.	1 oz.	4-6	25-50 days

*Some authorities give the same dates for Southern as for Central Florida

SEEDING AND PLANTING DATA—Continued

CROP	Time for Seeding or Transplanting		Amount of Seed Required to Plant		Days Required for Seed to "Come Up"	Time Required for Crop to Mature Reckoned from Time of Seeding
	In Northern and Central Florida	In Southern Florida	An Acre	100 Feet of Drill		
Rape	Jan, Mch, Aug-Dec	Jan, Aug-Dec	2-4 lbs. drilled 4-8 lbs. br'd-cast			
Rhodes grass	Feb-Apr, Oct-Nov	Oct-Mch				
Rice, lowland	Mch-June	Mch-June	1-3 bu.			120-150 days
Rice, upland	Mch-June	Mch-June	1-3 pks.			
Rutabagas	Feb-Apr, July-Sept	Aug-Nov	3-5 lbs.	¼ oz.		75-100 days
Rye	Nov-Dec		3-4 pks.			
Salsify	Feb-Mch, Aug-Sept		8 lbs.	1 oz.	8-12	110-125 days
Sorghum, non-saccharine	Apr-May	Mch-May	1½-2 bu.			90-120 days
Sorghum, saccharine	Apr-May	Mch-May	6 lbs.-½ bu.			90-120 days
Soybeans	May-June	May-June	2-3 pks.		4-6	
Spinach	Feb, Aug-Nov	Jan, Feb, Aug-Nov	10 lbs.	1 oz.	6-12	60-100 days
Squash ("simlins")	Mch-Sept	Feb-Sept, Nov	3 lbs.	½ oz.	6-10	60-75 days
Strawberry plants	Oct	Oct	21,000 plants			
Sudan grass	Mch-May	Feb-May	4-6 lbs. dril'd 16-24 br'd-cast			
Sugar cane	Oct-Nov, Mch	Oct-Nov, Feb	4 tons cane			
Sweet potato	Apr-July	Apr-July	1½-4 bu.	3 lbs. or 75 slips		
Swiss chard	Feb-Mch, Aug-Nov	Aug-Dec			7-10	
Tomato seed	Jan, May, July	Jan, Mch-Aug	3 oz.	⅛ oz.	6-10	90-120 days
Tomato plants	Mch-Aug	Mch-Aug				
Turnip	Jan, Mch, Apr, Aug-Nov	Jan, Aug-Nov	1½ lbs.	½ oz.	4-7	60-75 days
Velvet beans	Apr-June	Apr-June	1-4 pks.			
Vetch	Sept-Nov	Sept-Nov	1 bu. and 1 bu. rye			
Watermelons	Mch-July	Mch, June-July	2½ lbs.	1 oz.	8-12	100-125 days

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